

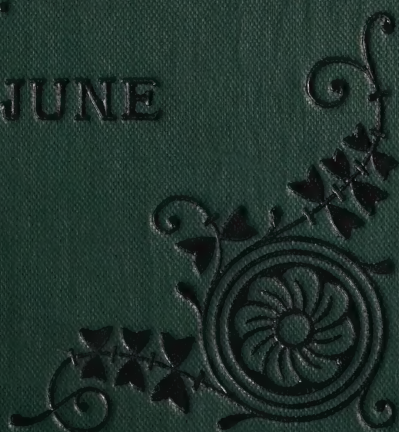
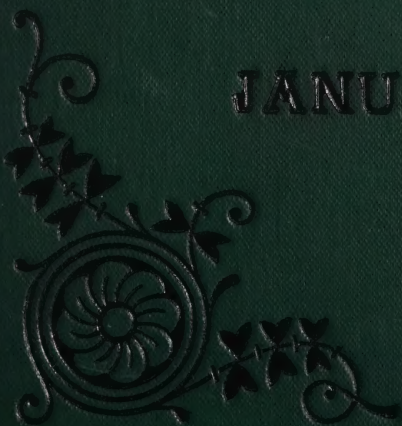
THE
RAILWAY
MAGAZINE
ILLUSTRATED



VOL. IV.

JANUARY to JUNE

1899.



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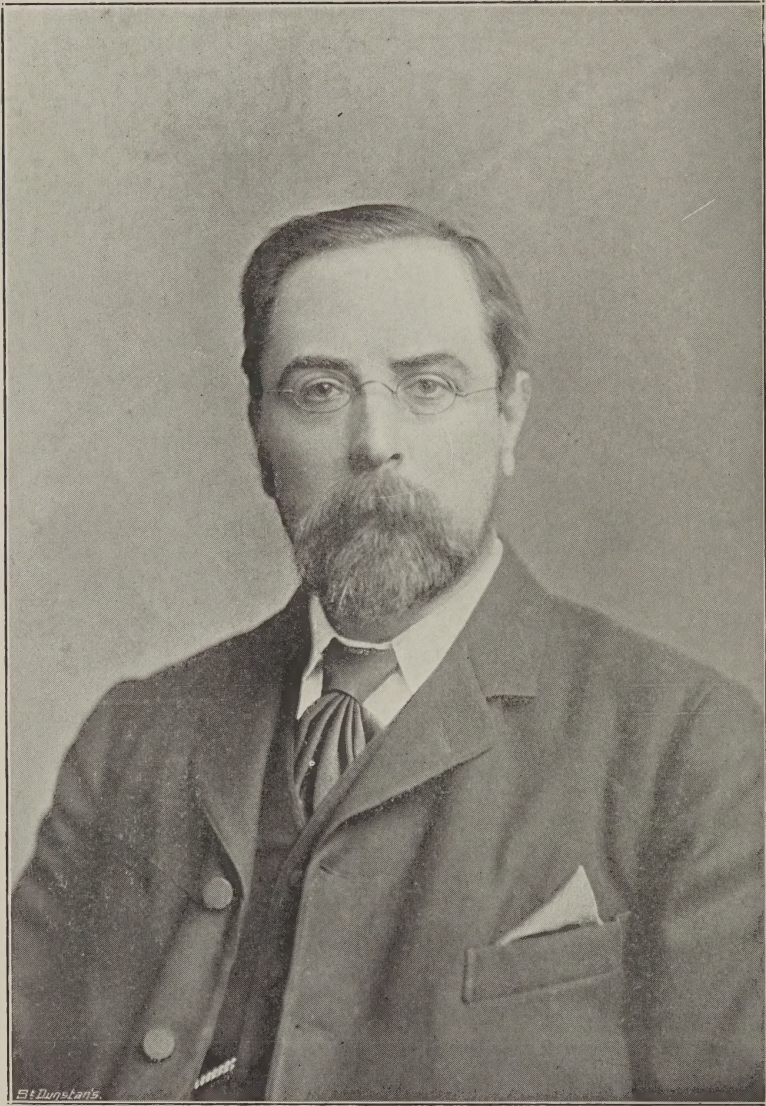
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R. Vinson Stanley
from his Stationary friend
Nov. 1900.

pg 6



Yours faithfully
J. A. Wilson

THE
RAILWAY MAGAZINE

VOL. IV.
JANUARY TO JUNE,
1899

LONDON
79 AND 80, TEMPLE CHAMBERS, TEMPLE AVENUE, E.C.



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THE RAILWAY MAGAZINE

JANUARY, 1899

ILLUSTRATED INTERVIEWS

No. 19.—MR. THOMAS ADDY WILSON

General Manager, Highland Railway

“YOU invited me,” said Mr. Wilson, at once proceeding to business, “to give you some information for the RAILWAY

MAGAZINE about the Highland Railway, and as I had business in town I thought it might be more convenient for you to meet me here rather than to come to our headquarters at Inverness, but if you prefer to see me at home I shall be delighted to have your company on my journey North this evening, and we could have our chat in my office in the morning.”

“What distance is it from London to Inverness—I mean, as we have come to reckon distance in these days, as regards time?”

“Leaving Euston or King’s Cross at eight o’clock, we would reach Inverness at 9.30 next morning.”

“You don’t seem to think much of a journey of 600 miles, and at this time of the year?”

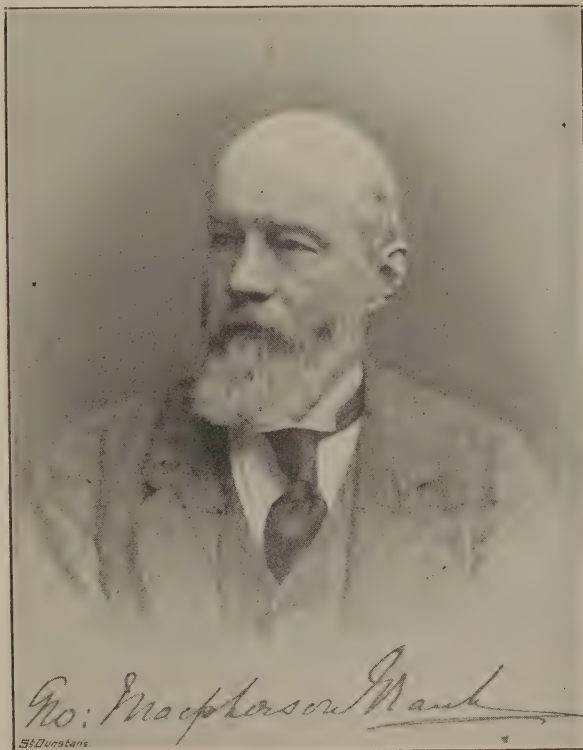
“Well, considering that you step into a sleeping-car, and drop off to sleep almost as if one were in one’s own bed, there is nothing

very heroic about, it, is there? But as to the matter in hand, you must remember that I have only been in Inverness a few months.”

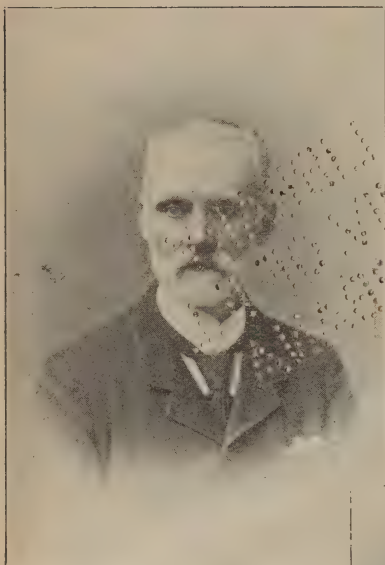
“Yes, I know; but even in that time you will, no doubt, have obtained some information about the history of the line, and a good deal about its working. The Highland is only a small line, I believe?”

“Now I call that unkind, although I know you don’t mean it. The Highland a small line! Compared with the big lines in England, and the North British and

Caledonian in Scotland, yes; but if you had travelled over it from end to end you would never again speak of it as a small line. Why, taking in all the ramifications of the Highland



SIR GEO. MACPHERSON-GRANT, BART.
Chairman, Highland Railway



MR. WM. GOWENLOCK
Secretary, Highland Railway

Railway, we can run you over close upon 500 miles of railway. Here is a map of the Scottish railways, from which you will see that the Highland extends from Perth—or, to be strictly accurate, from Stanley Junction, on the Caledonian Railway—to Wick and Thurso, with a double route from Aviemore to Inverness, and branches to Aberfeldy, Fortrose, and Strathpeffer, and then we can take you from Keith across Scotland to Kyle of Lochalsh on the West Coast, where you are within five minutes' sail of the Island of Skye. This line has branches to Buckie and other coast towns on the Moray Firth to tap the fish traffic."

"I am sure the readers of the RAILWAY MAGAZINE would be interested in a few particulars regarding the history of the Highland line—that is, as to how it originated and developed into so important a concern?"

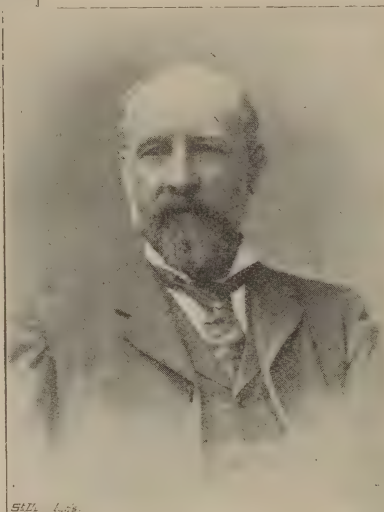
"The history of the Highland is both unique and interesting. I wish I could tell it you with the enthusiasm of a Highlander. Let me remark that the Highland Rail-

way is, in its main features, a distinctly Highland creation, and that it reflects the utmost credit upon the enterprise and patriotism of the Highland people, especially on the landowners in the seven counties through which it passes. The line started from Inverness, the capital of the Highlands, and stretched itself outwards south, east, north, and west with surprising energy, pressing forward to meet the southern and eastern companies, rather than wait to be met by them. The fact is that the people of Inverness became affected with the prevailing railway fever in the early forties, and one cannot wonder at their becoming enamoured of the new means of locomotion with all its advantages when the hardships of travelling by stage coach hundreds of miles over the mountains are considered, or by a slow coasting steamer to Leith or London. Local

historians mention that the leading merchants used to solemnly make their wills in those days before undertaking a journey to Edinburgh or London."

"I presume the Highland line was not all constructed by one company?"

"No; like most, if not all, other railways, it was made up of amalgamations. Though the first part of the

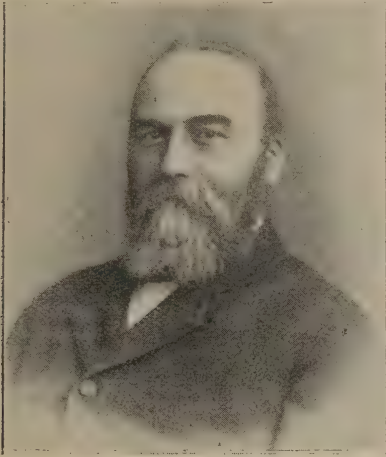


MR. GEO. THOMSON
Goods Manager, Highland Railway



MR. WM. GARROW
Supt. of Line, Highland Railway

system was opened in 1855, it was not till the year 1884 that the various sections which had been promoted and constructed separately were united under the comprehen-



MR. C. LAMOND
Accountant, Highland Railway

sive and euphonious title of the Highland Railway. So far as I can make out it was in the year 1845 the first proposal was submitted to a Parliamentary Committee for a railway from Inverness to Perth. The project originated in Inverness. It is interesting to note that the route selected was that followed by the stage coaches—that is, across the Monadhliadh and Grampian ranges through passes 1,323ft. and 1,462ft. respectively above sea level. The scheme quite staggered the Committee. Mr. Wrangham, Mr. Bellasis, Mr. Hope (afterwards Mr. Hope-Scott), and Mr. Gordon (afterwards Lord Gordon) were counsel for the promoters, and Messrs. Graham and Wemyss, Parliamentary Solicitors. A sentence or two from the speech of Mr. William Austin, one of the opposing counsel in this Parliamentary contest, is interesting in the light of subsequent events:—‘Ascending such a summit as 1,450ft.’ he is reported to have said, ‘was very unprecedented, and Mr. Mitchell, the engineer, was the greatest mountain climber he had heard of. He beat Napoleon outright, and quite eclipsed Hannibal. He

read a book the other day, of several hundred pages, describing how Hannibal crossed the Alps, but after this line will have passed he had no doubt quartos would be written about Mr. Mitchell!’ The Bill was thrown out, the Committee stating that experience had not, so far, substantiated the practicability of working long gradients over a height of 1,450ft. above sea level. It is somewhat remarkable, and I should like this specially noted, that the engineer who was the moving spirit of the projected railway, and boldly put forward plans for crossing the Grampians, was an Invernessian. He was in advance of his times, for, be it remembered, it was then the custom to go to enormous cost to secure perfectly level lines. Mr. Joseph Mitchell, the engineer referred to, lived to make his line over the Grampians, but by that time locomotives had, of course, been immensely improved in haulage power. The first line constructed in the Northern Highlands was the Inverness and Nairn Railway, fifteen miles in length, and connecting these two flourishing burghs. The



MR. J. G. BULMER
Store Supt., Highland Railway

Countess of Seafield cut the first sod on September 21st, 1854, and the line was opened on November 5th, 1855, about thirty years after the earliest railways were made in England, I

MAP OF THE
HIGHLAND RAILWAY
AND ITS CONNECTIONS.

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

The Highland Railway shown, also
Railways in connection
Other Railways
Steamship Routes in summer
Coast Route



may mention that the Earls of Seafield, the chiefs of Clan Grant, were always directors of the Highland Railway till the death of the eighth earl, in the prime of life, about the year 1884."



OLD LOCOMOTIVE BUILT FOR THE INVERNESS AND ABERDEEN JUNCTION R.WY. (NOW AMALGAMATED WITH THE HIGHLAND R.WY.) IN 1859 BY HAWTHORNS AND CO., LEITH, N.B.

"It may be of interest to state who were the pioneers of railway building in the Highlands."

"Yes; they deserve all honour. The names of the first directors are Cluny Macpherson of Cluny, who was Chairman, Mr. E. W. Mackintosh of Raigmore, Lieut.-Colonel Alex. Finlay, Captain Fraser-Tytler, Mr. Robert Fraser, Mr. Chas. Stewart, Mr. H. W. White, Mr. Alex. Smith, Mr. John Dunbar, Mr. Alex. Forbes, Mr. Colin Lyon Mackenzie, and Lieut.-Colonel Hugh Inglis. I believe none are surviving now except Raigmore, who remained a director till 1895, when he resigned, having been Chairman of the Company for the last five years. Having got to Nairn no time was lost in extending the line eastwards, the idea being to form a junction with the Great North Railway at Elgin, and thus secure a through route via Keith to Aberdeen, and thence to the south. It is a circuitous route, Aberdeen being 108 miles almost straight east from Inverness, but it was better than nothing. The Aberdeen

Company are reported to have proposed that the Highland Company should extend their line to Keith, in which event they would contribute £40,000 to the cost of the work. To this the Highland directors agreed, and the line was opened to Keith in 1858. The representatives of the Aberdeen Company attended meetings of the Inverness Company in virtue of their holding of £40,000, but they did not get on with the Highland directors, and according to the newspaper reports of the period the meetings were frequently of a stormy kind, and there was rather a dramatic ending to the relationship. Mr. Matheson, who was chairman of a meeting on January 5th, 1860, which was more unpleasant than usual,

is reported to have produced his cheque-book and said: 'There is your cheque for £40,000, and there is the door.' Perhaps the



NAIRN VIADUCT, NEAR CULLODEN MOOR STATION, HIGHLAND RAILWAY

story has lost nothing in passing down these forty years, and your readers must take it for what it is worth. Anyhow, the incident ended the financial connection that existed between the Inverness and Aberdeen Companies."



"And as to the present relations between the Highland and the Great North Railways?"

"Well, I hope I may say they are not unfriendly. So far as the Highland is concerned we simply want to be let alone. We have our own work in our own territory, and our hands are pretty full; much money has been thrown away by both Companies in Parliamentary contests, and we do not wish to throw away any more. But we are digressing. Here is a prospectus of the Inverness and Aberdeen Junction Company; you observe it bears the names of the Earl of Seafield, who was Chairman, the Marquis of Stafford, M.P., Lord Berridale, Mr. Alex. Matheson, M.P., Mr. Dudley Coutts Marjoribanks of Guisachan, the Hon. T. C. Bruce, Captain Fraser-Tytler, Mr. Mackintosh of Raigmore, and others—all names well and honourably known in the Highlands."

"And now about subsequent developments, were they rapid?"

"Rapid and enterprising indeed, as you will see from this brief summary. The line to

tion Company; whilst the Ross-shire Company was meantime formed to make a line from Inverness to Invergordon, a distance of 31½ miles, which was opened throughout early in 1863. Before this railway was finished, I



SIDE VIEW OF A LOCOMOTIVE SNOW-PLOUGH, HIGHLAND RAILWAY

think in 1862, there was an amalgamation between the Inverness and Aberdeen Junction Company and the Ross-shire. In 1861 a company was formed under the title of the Inverness and Perth Junction to construct a line from Forres up through Strathspey, and over the Grampians into the Valley of the Tay, where it joined and took over a railway which had been formed to Dunkeld, and it branched off *en route* at Ballinling to Aberfeldy. Parliamentary Committees had by this time, you see, got over their scruples as to hill climbing by locomotives. It was claimed by the engineer, Mr. Mitchell, that this line was constructed more rapidly than any other railway in the kingdom, while it reached the highest altitude yet attained in Britain—1,488ft.

"The other day I came across the following incident recorded in the 'Aberdeen Journal.' It may not have had everything to do with the formation of this portion of the Highland line, but there is reason to believe that it helped to accelerate the project: 'An omnibus used to convey the

through south passengers from Guild Street to Waterloo Station (Aberdeen). One day it happened that the mail train from the south was late, and on it were several



FRONT VIEW OF SNOW-PLOUGH, AS FIXED TO A HIGHLAND RAILWAY LOCOMOTIVE

Keith was opened throughout in August, 1858. Three years later there was an amalgamation between the Inverness and Nairn Company and the Inverness and Aberdeen Junc-

influential Highland gentlemen travelling to Inverness. The Great North train was timed to leave Waterloo at 3 p.m., and about three minutes before that hour the omnibus

completed in its main features, and, as I have said before, the whole of these not inconsiderable undertakings, independently promoted and executed, became by final Act the Highland Railway."

"Where did all the money come from for these various costly works, may I ask, for I understood you to say at the outset that the Highland Railway was a Highland creation and due to local enterprise?"

"That is a question which it is a delight to answer, because it brings out a self-sacrificing feature in Highland character where the absolute good of the country is concerned, which is comparatively rare in the commercial history of modern times. A few figures will, I

am sure, convince you. The capital expenditure on the Dingwall and Skye Railway at the date of amalgamation with the Highland Company in 1880 amounted to £311,957, and the ordinary shareholders had to sacrifice one half of their holdings, in addition to receiving no dividend prior to that date. No dividend was paid during the first seven years of the Sutherland Railway Company, the capital of which amounted to £211,852, and an exchange



LOCOMOTIVES WITH STEAM PLOUGH CLEARING THE LINE,

was seen tearing along the quay. The Great North officials are stated to have shut the station doors in the faces of the Highlanders, and refused to open in response to the thundering knocks made upon them. It was a dear *closure* to the Great North, for the irate Gaels resolved there and then that they would make a line through the Highlands to Perth, and so be independent of the disobliging Sassenachs.'

"At the risk of going too much into detail, I may state that the Inverness and Aberdeen Junction Company, in 1864, extended their line from Invergordon to Bonar Bridge, 26½ miles; that the Skye line from Dingwall to Stromeferry, 53 miles, was opened in 1870; the Sutherland Railway, from Bonar Bridge to Golspie, 26½ miles, in 1868; the Duke of Sutherland's Railway, from Golspie to Helmsdale, 17 miles, in 1871; and the Sutherland and Caithness Railway, from Helmsdale to Wick and Thurso, 66 miles, in 1874. And thus was the edifice, so to speak,



NEW COMPOSITE CORRIDOR CARRIAGE, HIGHLAND RAILWAY
BUILT AT THE COMPANY'S LOCHGORM WORKS

was effected at the rate of 60 per cent. of Highland Railway stock when the amalgamation took place; the Duke of Sutherland's Railway cost £72,182, and he parted with it at a discount of 13 per cent.; the Sutherland and Caithness Railway cost £433,266, and was



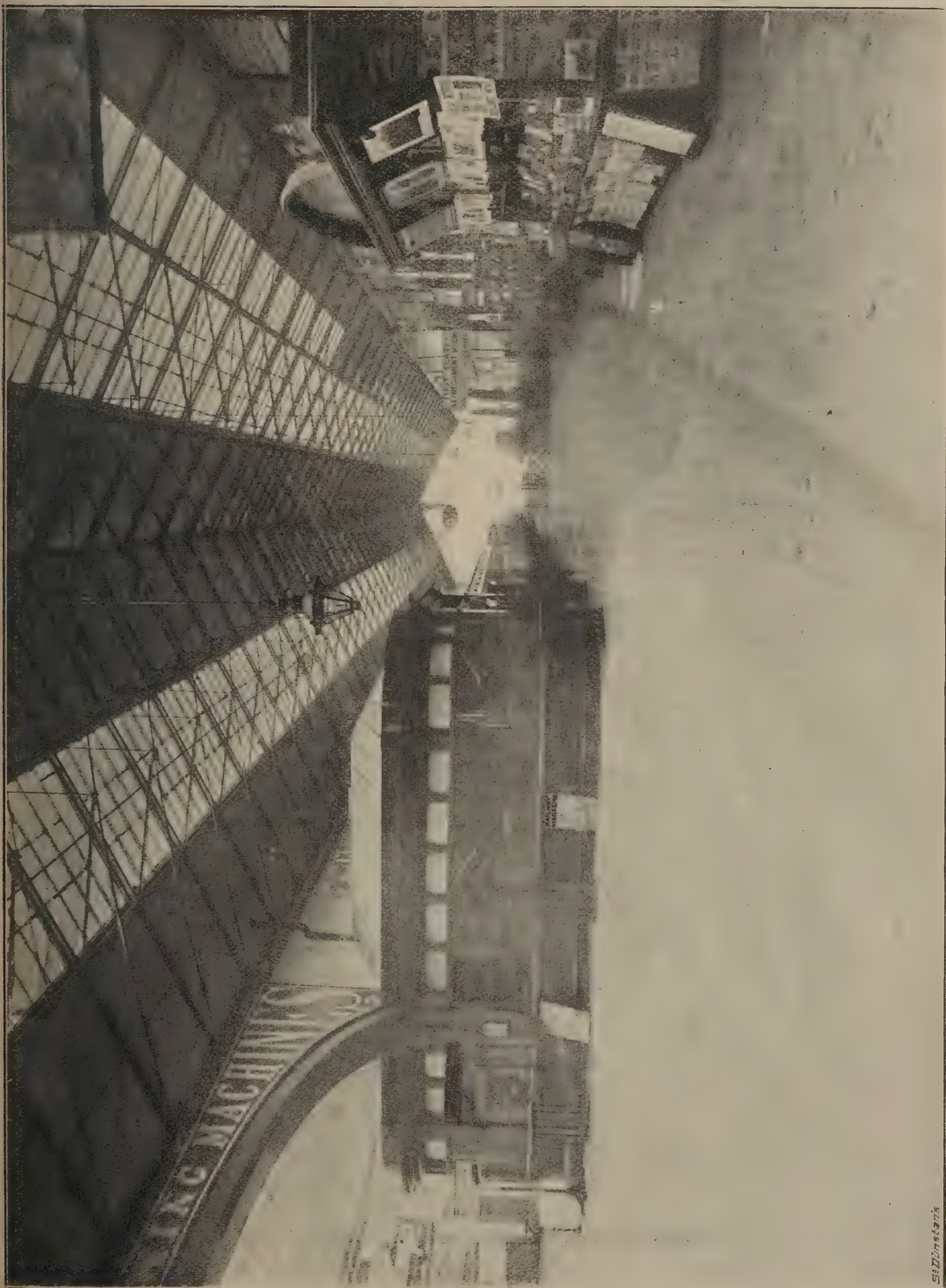
EXTERIOR OF INVERNESS STATION, THE HEADQUARTERS OF THE HIGHLAND RAILWAY

taken over by the Highland at a discount of 50 per cent., no dividend ever having been paid the shareholders. That, however, is but one aspect of the case. The financial situation was summed up some years ago by Mr. Dougall, a former manager, in these sentences: 'On the completion of the various lines it was found that, although the proprietors and others in the district had subscribed largely towards them, £1,200,000 was required to equip and open them for traffic. This money had to be raised, and the directors gave their personal security to the banks and insurance offices, the whole of them becoming thus, jointly and severally, responsible for the amount. The obligation continued for ten years, but in consequence of the steady development of the traffic, it was ultimately discharged without the directors losing a single sixpence.'

"You say proprietors and others subscribed largely, which means, I presume, that they tabled considerable sums as free donations? Could you mention a few?"

"There were thirty-two subscribers, who between them paid in full the sum of £872,773. The Duke of Sutherland gave £355,545; the Earl of Seafield, £73,370; Sir Alex. Matheson, M.P., £73,623; Mr. James Merry, M.P., of Belladrum, £85,000; Lord Albert Leveson-Gower and Lord Ronald Leveson-Gower, £40,000 each; Mr. Mackintosh of Raigmore, £26,500; Sir James Falshaw, £29,080; Lord Tweedmouth, £18,000; the Marquis of Stafford, £20,000; Cluny Macpherson of Cluny, £13,064; Mr. J. Grant Peterkin of Grange, £11,031; the Duke of Atholl, £3,150; Mr. Macleod of Cadboll, £6,000; Sir George Macpherson-Grant, £2,400; Colonel Fraser-Tytler of Aldourie, £6,720; the Marquis of Breadalbane, £2,000; Mr. Baillie of Dochfour, £3,000; and so on, most of the names I mention still being identified with the Highland Railway directorate. These gentlemen had, of course, a personal interest in the development of the country by railways, in the sense that land values would be increased and the growing taste for sport would turn their moors

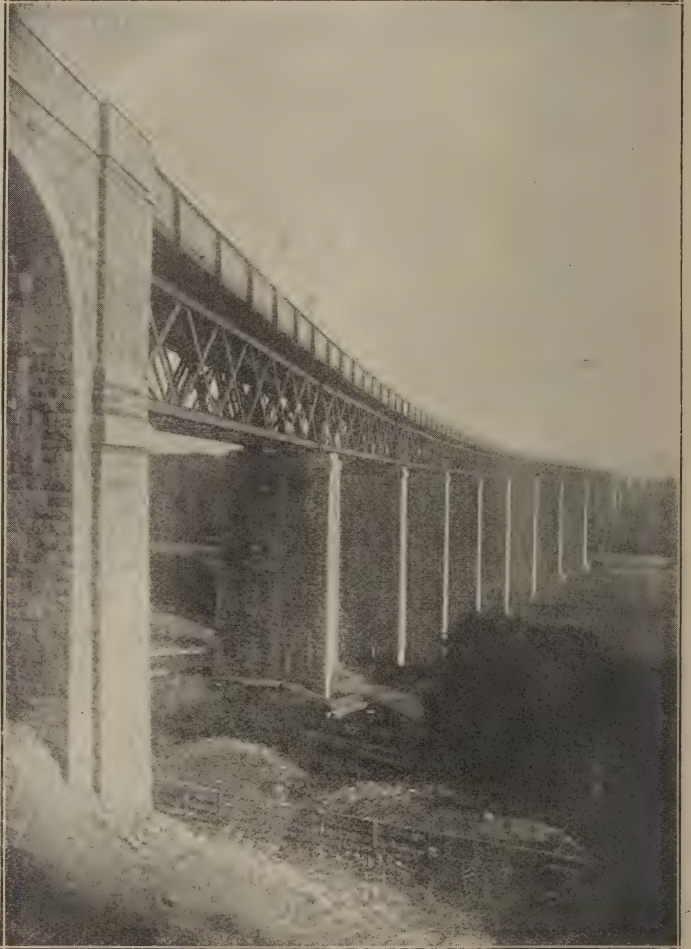
and forests into sources of wealth, but their public spirit is none the less apparent and creditable. I do not know where you will find its equal. While on this subject of the early difficulties it might interest your readers were I to outline some of the disadvantages of the Highland Railway which still remain. Our large cities, with their teeming populations, their colossal and varied industries, present difficult and almost despairing problems to the managers of some of our railways. They have literally more traffic than they know what to do with, and have actually had to consider how to restrict it. Nevertheless, since I went North I have often indulged the wish that we had a score, or I would be content with half a score, of really big towns in the Highlands. Our difficulties and anxieties are of quite another sort, and we often realise that there are serious disadvantages—from a railway manager's point of view—in being so far distant from the centres of population. The Northern Highlands are very sparsely populated. In some parts you may travel miles and miles without seeing a single residence—not even a crofter's cottage—and it is terribly disappointing after exercising one's ingenuity and working hard and anxiously to find that your traffic returns show such a small result in the shape of increased revenue; and how careful one has to be in the matter of expenditure! Passengers and traders, and especially friends of my own from England, accustomed to the facilities and large traffics of the big lines, often give me excellent advice as to what we should do; and in travelling over the line there are many things I should like to see different; but we have to put them aside for the present, because an expenditure that would be justifiable and proper on another railway would be sheer extravagance on ours; and my directors, with their intimate knowledge of the Highlands and their large experience of affairs, would quickly put me right were I to go to them with proposals which might be perfectly fitting on some other railways. I have already learned that the Highland line requires an experience peculiarly its own, and many things I learned



INTERIOR OF INVERNESS STATION (SOUTH DEPARTURE PLATFORM), HIGHLAND RAILWAY

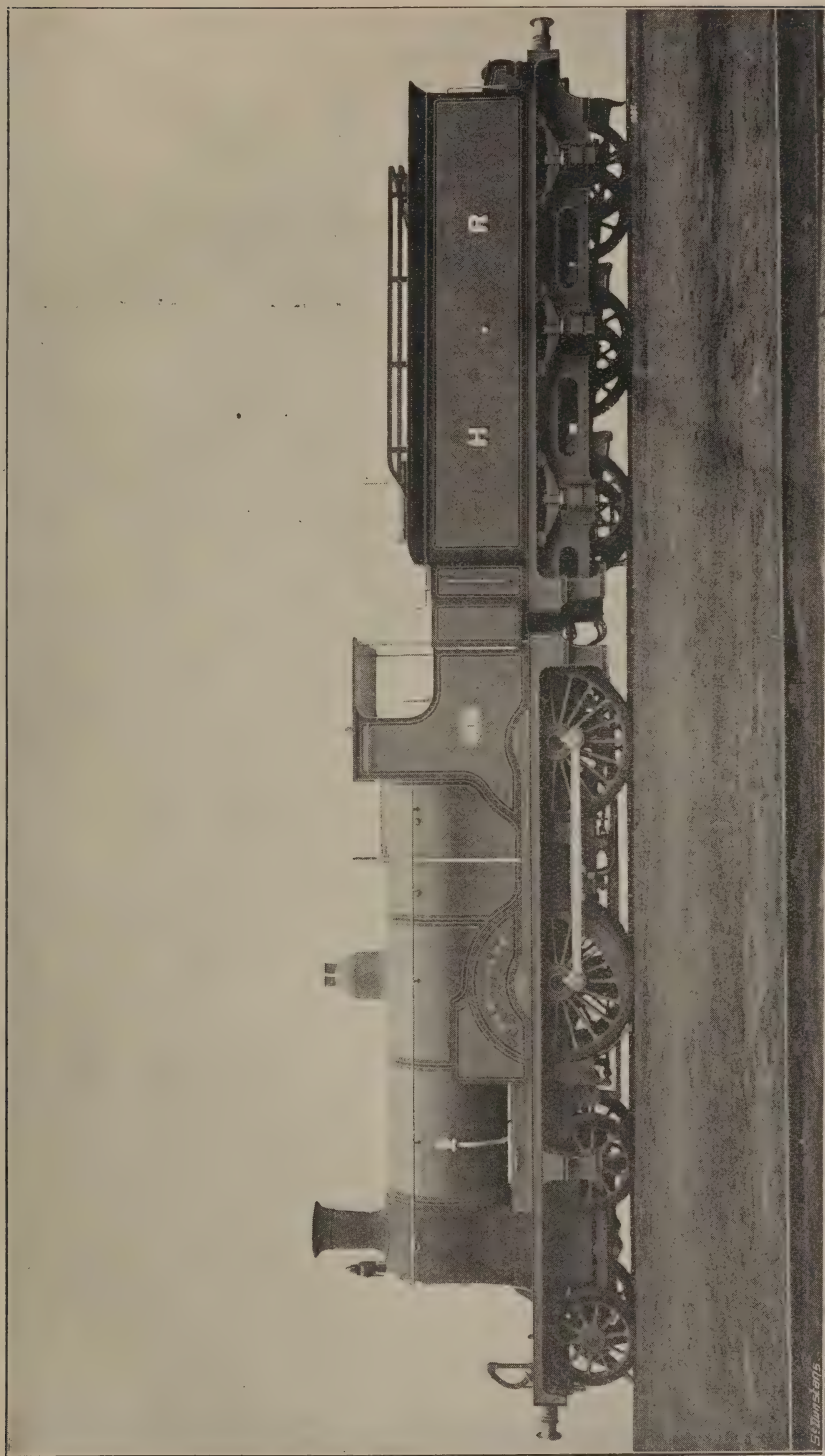
during my service on the North Eastern I have had practically to unlearn, or at least to suppress, on the Highland, there being no occasion for their application. There is a great deal of what we term unremunerative work on the Highland—more, I believe, than on any other railway in the kingdom. The steep gradients on the line, which are of course inevitable, are responsible for a great deal of this. Gradients of 1 in 60 and 1 in 70 are almost common on our line. Most of our passenger trains require two, and sometimes three, engines to haul them over the mountains, which involves serious expenditure. And our goods trains are comparatively lightly loaded for the same reason. Having to use two engines for trains, which on an ordinary level line would require one only, our working expenses are, of course, doubled. Then our traffic is peculiar in being largely in one direction. For example, during the tourist season we have, as you know, a large traffic to the Highlands. Trains of eighteen or twenty coaches are run from Perth to Inverness and the North, sometimes 200 or 300 miles, and they have to be hauled back *empty*. Then at the close of the season the process is reversed, the traffic being chiefly *towards* Perth—families and establishments returning to their homes—and the stock has to be taken back to Inverness empty. It is the same with the fish traffic. We run trains from Wick, Kyle of Lochalsh, Helmsdale, and other places to Perth *en route* for London, but the wagons are all returned empty. In a

lesser degree this also applies to our goods traffic. We should show a very different result had we traffic in both directions at the same time. Then, again, we are subject to severe competition by the Caledonian Canal and also by sea, so that our passenger fares



THE FINDHORN VIADUCT, NEAR TOMATIN STATION, ON THE RECENTLY OPENED DIRECT LINE, AVIEMORE TO INVERNESS, HIGHLAND RAILWAY

and merchandise rates have to be cut so low as to leave small profits. We draw our coal supplies for locomotive and other purposes from Fifeshire; and here, again, there is the inevitable haulage for very long distances, such as no other railway has any experience of."



"No. 1," THE LATEST FOUR-COUPLED BOGIE EXPRESS ENGINE OF THE HIGHLAND RAILWAY
 Constructed from the designs of Mr. Peter Drummond, M.I.M.E., Locomotive Superintendent, Highland Railway
 Cylinders, 18½ in. diameter, 26 in. stroke; coupled wheels, 6 ft. diameter

"These are serious drawbacks, yet I believe the Highland directors have not lost their enterprise?"

"No; several important undertakings have been carried through within recent years, among which I may mention a branch from Dingwall to that popular and inland health resort, Strathpeffer Spa; the Black Isle line,



DUNROBIN STATION, THE PRIVATE STATION OF THE DUKE OF SUTHERLAND, HIGHLAND RAILWAY

11½ miles, from Muir of Ord to Fortrose, a prospering summer resort on the Moray Firth; the extension of the Skye line from Stromeferry to Kyle of Lochalsh, 10 miles; and the Inverness and Aviemore line, just opened, 34 miles. The Kyle extension was a very costly bit of work, almost the entire track having to be excavated out of the solid rock along the shores of Loch Carron, but the importance of getting the Highland Railway into closer touch with the West Coast steamer service was such that the Government voted £45,000 towards the outlay. Herring fishing is a great industry at Stornoway and other Hebridean ports, and its development had something to do with the large expenditure in effecting this extension. Apart from that consideration, the scenery is of a most magnificent description, and we believe Kyle of Lochalsh will in time, as it becomes known, prove a popular resort with holiday makers. Our *magnum opus* has, however, been the construction of the Inverness and Aviemore Rail-

way, which shortens the journey between the Highland capital and Perth by practically an hour. That will prove of vast importance to the travelling public, and it also opens up a piece of bracing country, which is sure to attract health seekers. Though only 34 miles long, this line will have cost, when everything is settled up, not much short of a million.

As you will see from the photographs I have brought you, it crosses two great valleys by immense viaducts, and also wild passes in the mountains, which had to be bridged at a tremendous outlay. The largest viaduct is that across the Nairn Valley. It has a total length of 1,785ft. and a maximum height of 130ft. from the level of the river. There are 29 arches, each of 50ft. span, except the centre arch, under which the river flows, which has a span of 100ft. It is constructed of stone throughout. It was built by Messrs. Charles Brand and Son, Glasgow. The Findhorn Viaduct is also an enormous piece of engineering, having a length of 1,335ft. and a maximum

height of 140ft., and consists of nine spans of 130ft. In the 34 miles of this railway there are 150 bridges of various sizes and four viaducts, two of them, as I have stated, being exceptionally large; while earthwork had to be dealt with in respect of cuttings and embankments to the extent of considerably over two million cubic yards."

"Your railway is famous for snow blocks, I believe?"

"I can scarcely dispute that, having regard to the pictures you have just been examining with so much interest. On a railway such as ours, traversing vast tracts of moorland and skirting huge mountains upon which the snow lies deep and generally powdery, such incidents are inevitable. Given certain conditions, a strong breeze will obliterate the railway track in five minutes, though no snow be falling, snow-drift having the sudden overwhelming character of a sand-storm in the desert. No expense is, however, spared to prevent snow blocks, and it now rarely happens

that there is any very serious detention on the Inverness and Perth line from this cause. We adopt the usual remedy of pilot engines armed with snow-ploughs, which are kept running when danger is reported, while extensive and substantial snow fences, three tiers deep in some places, have been erected at varying distances from the sides of the cuttings on the more exposed parts of the line—through the bleak moors of Caithness and Sutherland, at Dava and Drumochter, and on the heights of the Aviemore direct line—and have been found very effective for intercepting the drifts. Recently ‘snow-blowers,’ which are expected to prove as effective in keeping the rails clear of drift snow as they have already done in keeping the line clear of drift sand on the Burghead branch. In a severe winter the line is in almost a chronic state of snow block in the neighbourhood of the Sutherland and Caithness county march, but there has been no block of exceptional magnitude on the Perth section since March, 1881, when traffic was closed for about six weeks. Trains of live stock and fish were lost on that occasion. A whole goods train was, I am informed, dug out of 30ft. of snow at Dava in that year.”

“Your line in all aspects is, as you said a little while since, really unique. Would you mind giving me some particulars as to how the traffic is worked during your busy season?”

“That is from about July 26th or 28th to August 12th. Ah! that is a trying fortnight

for the staff of the Highland Railway. Imagine the difficulties. All the English and Scottish lines converge at Perth, which has been described as the Clapham Junction of Scotland, and a great proportion of the traffic by each train is destined for the districts served by the Highland Railway. Owing to the excessive traffic the trains, including the London mails, are invariably late. As many as sixty to eighty vehicles of all sorts—passenger coaches, family carriages, mail-vans, horse-boxes, luggage and parcels vans, etc.—will be handed over to the Highland during the early hours of the morning, and you are required to distribute them all over the Highland system, at the same time maintaining your ordinary train service, and you have a single line of rails! On single lines the train service, as you know, is built up on an



LOCOMOTIVES FIGHTING THE SNOW-FIEND ON THE HIGHLAND RAILWAY

arrangement under which trains in opposite directions cross or pass each other at certain stations, but when the trains arrive at Perth late they are of course correspondingly late in leaving, and a special time-table has to be improvised and announced to the stations by telegraph from the office of the Superin-

tendent of the Line. It is an anxious time, but it has its compensations. It is exhilarating to see the line so crowded with traffic. And as a rule everybody is in the best humour; they have got away from the madding crowd and the daily drudgery, and are off to the delightful Highlands anticipating the 'glorious Twelfth.' The unusual pressure taxes our resources, but our staff do their best, and when I see the traffic receipts my chief regret is that this fortnight before the 'Twelfth' is all too short."

"Is there any falling off in this traffic, which is, I think, peculiar to the Highlands?"

"Peculiar in regard to extent, yes. I know something of the Yorkshire Moors, but there is of course no comparison between the number of 'shooting tenants' in Yorkshire and the number in the Highlands. Last year we carried 2,008,940 passengers, an increase of 67,931 over the previous year. The figures seem insignificant compared with the big lines, but it was a satisfactory increase to us."

"Do you offer any special facilities to encourage traffic?"

"Well, we make every provision we can for the convenience of our passengers. We have circular tours, almost a hundred of them; we have weekly and fortnightly season tickets; we are cultivating an excursion traffic, and from July last our directors decided to issue week-end tickets at a single fare for the double journey, the tickets being available from the Friday or Saturday to the Monday."

"Which is your fastest train?"

"We have no fast trains in the sense in which the term is ordinarily understood; the

gradients of our line prevent our running express speed for long distances. Some of our trains run over certain parts of the line at the rate of fifty to sixty miles per hour, but that cannot be maintained in climbing gradients of 1 in 60 for a dozen miles."

"Speaking of your passenger traffic, will you tell me whether the visitors to the Highlands are 'birds of passage' merely, or do they make a stay, as at Brighton, for instance?"

"A large and increasing number of 'shooting tenants' occupy residences all over the Highlands for several weeks, and have large shooting parties, but there are hundreds of visitors who stay from a week to a month, and for their convenience we issue a list of furnished lodgings, containing about a hundred pages, which has proved very useful to parties in search of summer quarters, particularly in the letting of farm-houses and country cottages. Then there are villages and small towns to which visitors crowd during the summer, such places as Dunkeld, Birnam, Pitlochry, Aberfeldy, Kingussie, Grantown, Carrbridge, Forres, and Nairn, between Perth and Inverness; and north of Inverness we have Fortrose and Rosemarkie, Strathpeffer, Dornoch, and other places, all favourite resorts. Dornoch is the capital of Sutherland, and possesses one of the best golfing courses in the kingdom, and the town is shortly to be connected with the Highland Railway by means of a light railway from the Mound Station."

"I wish you to make a note, please, of our rolling stock. Here is an excerpt from our last half-yearly report:—

ROLLING STOCK.—31st AUGUST, 1898.

LOCO-MOTIVE.			COACHING.										MERCHANDISE AND MINERALS.										MISCELLANEOUS.									
Engines.	Tank Engines.	TOTAL.	Family Saloons.	First Class.	Composite.	Third Class.	Third Class Brake Carriages.	Post-Office and Parcel Post.	Passenger Luggage Vans.	Horse Boxes.	Carriage Trucks.	TOTAL.	Goods Brake Vans.	Covered Goods Vans.	Sheep Vans.	Cattle Wagons.	Goods Wagons.	Fish Wagons.	Timber Wagons.	TOTAL.	Ballast Wagons.	Portable Engine Wagon.	Fire Engines.	Travelling Cranes.	Tool Vans.	Crane Wagons.	Snow Ploughs.	Vitrol Tank Wagon.	TOTAL.			
119	14	133	2	54	49	155	12	14	57	25	20	388	55	130	6	17	1689	300	200	2656	34	1	2	3	2	5	1	99				

"You have 133 locomotives, I see. Does the Highland Company build its own engines and plant?"

"We have not done so in the past, but our workshops were recently equipped to enable us to do so. Here is a photo of our newest engine, designed by Mr. Drummond, our Locomotive Engineer. The engine has 6ft. driving wheels and 3ft. 6in. bogie wheels, with 18½in. cylinder, and a piston stroke of 26in. We are building new engines, new wagons, and our new carriages now running between Wick and Perth are furnished in a manner not to be despised by the most fastidious. Mr. Drummond tells me there are over a thousand men in the workshops at Inverness."

"Did you know the late engineer?"

"Mr. Murdoch Paterson? Yes; for a few months. I suppose no one could have such an intimate knowledge of the Highland Railway as he. I believe he was first assistant, and subsequently partner, with Mr. Joseph Mitchell, the pioneer of the Highland Railway, and for many years past he was the Company's Chief Engineer, and carried out all their engineering works. He died, as you know, in the house provided for the station-master at Culloden Moor, whither he had gone to be near his work, and particularly the Nairn Viaduct, the greatest of his works. It was a great regret to us all that he was not spared to see its opening. Mr. Roberts had had charge of our 'open lines' for several years, and has now succeeded to the position of Engineer-in-Chief. The late Sir John Fowler, of Forth Bridge fame, was Consulting Engineer to the Highland Railway for many years."

"Our readers would no doubt be glad to have photos of your traffic officers, and to know something of the character of your traffic."

"I will ask Mr. Garrow and Mr. Thomson

for their photos and send them to you. Apart from our passenger traffic, we have fish, live stock, agricultural produce, minerals, timber, and distilleries. We have some twenty distilleries scattered up and down the line, and they bring a fair amount of traffic. As to the farm, I may mention that we do a considerable traffic in dead meat from such places as Keith, Invergordon, Tain, and Dingwall, all centres of agricultural districts, whose cattle annually make their mark at Birmingham and Smithfield. The names of Rosehaugh and Meikle-Tarrel in Easter Ross, as prize-winners, are as familiar as that of Dalmeny. A roast of Keith beef was, I read the other day, a favourite at the Lord Mayor's banquet in London."

"What about the future of your line?"

"Everyone connected with the Highland has faith in the future, and the directors most of all; but for their faith the Highland line would never have been built. We are doubling the line from Perth county march to Blair Atholl, eighteen miles, and all the bridges and viaducts on the new Aviemore line are constructed for a double track. A double line between Perth and Inverness may come in time. I wish it would come in my time."

"What you have said has been very interesting, and I have no doubt the readers of the RAILWAY MAGAZINE will follow the further history of the Highland with more than usual interest. There is only one other question, and as it is of a personal kind I have left it to the last. Will you tell me what, in your judgment, is the chief qualification for the post of general manager?"

"I should say the capacity for hard work; there may be others, but this is essential. And now permit me to wish your readers, yourself, and your editor a Merry Christmas and a Happy New Year. Good-bye!"





Photo by]

G.W.R. MECHANIC'S INSTITUTION, NEW SWINDON
Erected 1855, Enlarged 1892

[Jeffries, New Swindon

THE SOCIAL ORGANISATIONS EXISTING AMONG RAILWAY EMPLOYÉES

By G. K. MILLS, *Secretary, Great Western Railway*



It will doubtless be admitted by all who are interested in the well-being of the staff upon whom the efficient working of our railways depends that it is of the utmost importance that each individual member should be encouraged to spend to the best possible advantage the periods of relaxation which he has at his disposal. To keep a *mens sana* requires a *corpus sanum*, and this is so well recognised by those who have the control of

our great railway companies that it is usual to find the names of directors and chief officers as presidents, and supporters in various ways of the numerous social and recreative organisations which have grown up among the young men who form the great bulk of the railway staff; and when an occasion of special importance takes place in the life of one of these organisations, such as the distribution of prizes to the members of an athletic club, the chair will generally be found to be taken by a director or an officer in high position, who takes this opportunity of indicating in a special manner the personal interest which he



Photo by]

THEATRE OR LARGE HALL, G.W.R. INSTITUTE, SWINDON

[Protheroe, New Swindon

feels in the welfare of those who form the working body of an undertaking of which he is also a member.

Most of our railway companies have their cricket, football, rowing, or other athletic clubs, their literary societies and chess clubs, all of which consist of and are managed by members of the staff; and, in addition to encouraging and contributing to the support of these, many of the larger railway companies have either provided or facilitated the erection at their chief centres of buildings fitted up as social and intellectual clubs for the benefit of their employes, such buildings being provided with billiard, smoking, and other rooms, with well-found libraries and other means of intellectual improvement, and in some of which classes are held and lectures given for various educational purposes suited to the requirements of the members. These are frequently supplemented by concerts and entertainments of a high order, the provision of

travelling facilities at cheap rates on special occasions, and in some instances by dining and tea rooms, where meals can be obtained at a very moderate rate. In addition to the assistance given in the provision of these club buildings the companies contribute liberally to their support, and the subscriptions of the members are fixed at a very low figure, in order to induce the largest number possible to take advantage of

the benefits which they afford.

To take the case of the Great Western Railway Company, with which I am most familiar, those who have paid a visit to the Works of that Company at Swindon will probably have had their attention drawn to the fine building in one of the main streets, which bears the name of the Mechanics' Institution, which—as its rules state—was established in 1844 “for the purposes of disseminating useful



Photo by]

CHESS AND DRAUGHTS ROOM, G.W.R. INSTITUTE, SWINDON

[Protheroe, New Swindon

knowledge and encouraging rational amusement among all classes of people employed by the Great Western Railway Company."

Started by a local improvement company, the institution is now the property of the members, who have from time to time, with the assistance of the Railway Company, considerably enlarged it, so that to-day it contains a circulating and reference library of upwards of 20,000 volumes, reading-rooms, rooms for billiards, bagatelle, chess, and other recreations, and a large hall, in which musical, dramatic, and other entertainments are held and lectures given on literary, scientific, and other subjects. In connection, moreover, with the Swindon and North Wilts Technical School, on the committee of which the Mechanics' Institution nominates three members, the members have the advantage of

joining the various classes in art, science, practical physics, etc., which have been established by the Technical Education Committee, and form, in fact, the great majority of the students.

The benefits of the institution have for some time past been thrown open at a slightly increased rate of subscription to persons not in the employ of the Great Western Railway Company, but the number so joining is (as is natural in a place like Swindon, where the population mainly consists of Great Western Railway employes) comparatively small. The total membership in March last was 7,866.

The rates of contribution are: For Great Western Railway employes, from 4d. to 10d. per month (varying with the rate of wages); for persons not in the employ of the Company, from 5s. to 12s. 6d. per annum. The directors of the Company contribute £100 per annum to the expenses of management, in addition to providing



Photo by]

[Protheroe, New Swindon

READING ROOM, G.W.R. INSTITUTE, SWINDON



Photo by]

[Protheroe, New Swindon

LADIES' READING ROOM, G.W.R. INSTITUTE, SWINDON

facilities and assistance in other ways. The directors have also in contemplation the establishment of an institute or club for social and recreative purposes 'somewhat on the same lines, but on a more modest scale, for the benefit of the clerical staff of the Company at Paddington, but hitherto they have been unable to find a suitable building for the purpose.

Similar institutions have been established by the London and North Western Railway Company at Crewe and Euston, by the Midland Company at Derby, the London and South Western Railway Company at Nine Elms and Eastleigh, the North Eastern Railway Company at York, Gateshead, and other places on their system, and the Great Northern Railway Company at King's Cross; and those who have seen these establishments will admit that a great deal is being done by the railway companies to render the unofficial life of their employes both healthy and profitable to themselves. It is almost needless to add that their efforts in this direction have been highly appreciated.

Too much cannot be said in favour of the policy of assisting and encouraging railway people to acquire an interest in some useful and healthful occupation or intellectual pursuit outside their ordinary business life. Not only is it indirectly beneficial to the employer that his employes should have a complete change of ideas when their business hours are over, and therefore to his interest to encourage useful and healthful modes of relaxation, but it is of untold benefit to the employe himself, who, in taking advantage of the benefits offered to him, is laying up in store a good foundation against the time that will come, sooner or later to all of us, when retirement from active business is prescribed, and when it will be a pleasure and solace to turn to some favourite pursuit, an interest in which was acquired when both mind and body were young and vigorous, and which will form a mental, and perhaps also a physical, occupation and enjoyment in the declining years of life.

THE PERMANENT WAY.

Another Version—See the "Railway Magazine" for December.

"One step at a time," said the ancient sage—

Oh, that youth would act on his word!

Leap not at "first"—respect wisdom and age—

And be content to travel *third*.

Upon the ladder of fame I stepp'd with care,

On a firm footing I reckoned;

And not till I could well afford the fare

Did I venture to travel *second*.

Thus travelling along, all safe and sound,

Fortune, undreamed of, on me burst;

For at last I gained the topmost round,

And now . . . I travel *first*.

J. B. D.

HOW THE TRAFFIC IS WORKED AT ST. ENOCH STATION (GLASGOW AND SOUTH WESTERN RAILWAY)

BY VICTOR L. WHITECHURCH



IN a recent number of the RAILWAY MAGAZINE mention was made of the exceedingly smart working of the trains in and out of St. Enoch Station, Glasgow, and an article on the subject promised. It was stated that the admirable arrangements for the traffic were in a great measure due to Mr. C. E. Cockburn, the Superintendent of the Line, and it is concerning some of these arrangements that I hope to be able in the following article to set down a few notes that will be of general interest to the lover of railways, be he expert or merely a member of the travelling public.

In the first place, then, a word or two concerning what is done by the Glasgow and South Western Railway for the convenience of the public. There is an old story told of a certain fidgety and forgetful old lady who once stepped up to the window of a booking-office and said:

"I want a ticket, please."

"Where to, ma'am?" replied the clerk.

"I don't know; I've quite forgotten the name of the place, but it costs ninepence halfpenny to get there!"

Well, set this same old lady in St. Enoch Station, and she certainly would have no excuse for loss of memory, for there she would see not only the name of the station to which she was bound staring her in the face, but the very part of the particular platform where she would find the train to take her there. The Glasgow and South Western claim that the St. Enoch "Train Information Office" is about the most complete thing of its kind in Europe or America. About the centre of the station, towering above the entrance to Nos.

4 and 5 platforms and surmounted by a large clock, is a sort of huge case with six windows, one for each of the six platforms which the station possesses, and the particular platform number to which each window applies being placed conspicuously over it. Each window contains three columns, a large one in the centre with the names of the stations and train destinations thereon, a small one at the left side showing the time at which the next train will start, and another on the right showing either "Front," "Middle," or "Rear," according to which part of the platform the train is arranged to start from. The system is very concise, very clear, and very simple.

I have before me as I write a pamphlet which contains a list of the times of departures and arrivals of all booked passenger trains at St. Enoch, commencing at 5.5 a.m. and ending at 11.55 p.m. On the right side is a blank column, in which the signalman inserts the actual times of arrival and departure, showing any lateness that may occur. This is done regularly every day, and submitted to the Superintendent of the Line, who can thus gather at a glance a comprehensive view of the previous day's workings, and ascertain what points require special attention.

Some idea of the traffic in and out of St. Enoch may be gathered when I state that, in accordance with the most recently compiled statistics, there are some 246 trains out and 257 trains into the station in the course of the day, making a total of 503 in and out. In addition to this nearly all these 503 trains have light engines following them in for the purpose of drawing them out, and the engines which brought them in originally have to be disposed of, so that altogether there is a gross total of over 1,000 movements of engines and trains in the ordinary way

without in the least taking into consideration the shunting of an extraordinary character, besides the transfers of through vehicles which come in from the North British system. In addition to this, in the summer months, when the Cockney arrays himself in a kilt and tries

familiar to stationmasters and inspectors, but of which the excursionist, who growls if his train is half a minute late, rarely dreams—documents which show more than anything else I know of the tremendous pains and labour involved by our railway officials in



TRAIN INFORMATION OFFICE, ST. ENOCH STATION, GLASGOW
(GLASGOW AND SOUTH WESTERN RAILWAY)

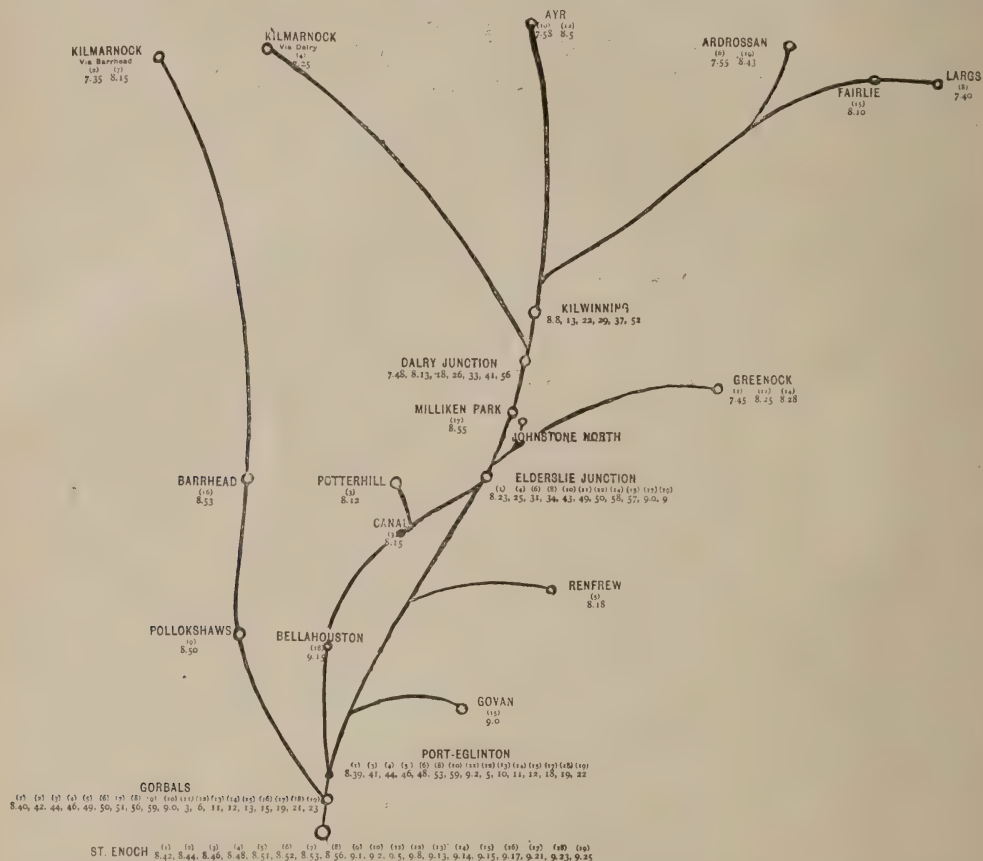
in vain to palm himself off on the "Canny Scot" as a "*laird*"—"puir feckless body!"—there is an unusually large traffic, which compels the division of the trains, and also the running of many "specials." I have been looking through a budget of the Superintendent's summer "circulars," those documents so

order to insure the comfort, the pleasure, and the safety of all who move from place to place by train, and I have laid down these same circulars with a feeling of bewilderment and thankfulness that I am not a traffic superintendent. Local excursions, Cook's excursions, "foreign companies' excursions, Sunday

schools, Volunteers, factory hands, temperance societies' excursions—it is a medley of work and pleasure if you like.

It was this exceedingly heavy traffic and the enormous amount of shunting it required that caused the management of the Glasgow and South Western Railway to take steps to provide a thorough system of electric signal-

entering this station is only an ordinary one, with one up and one down set of metals. Eventually the Company will double the line for some miles out of Glasgow, and add three or four platforms to their station; in fact, they are preparing to do so now, but for the present the above-described state of things prevails. The station is opened for a period



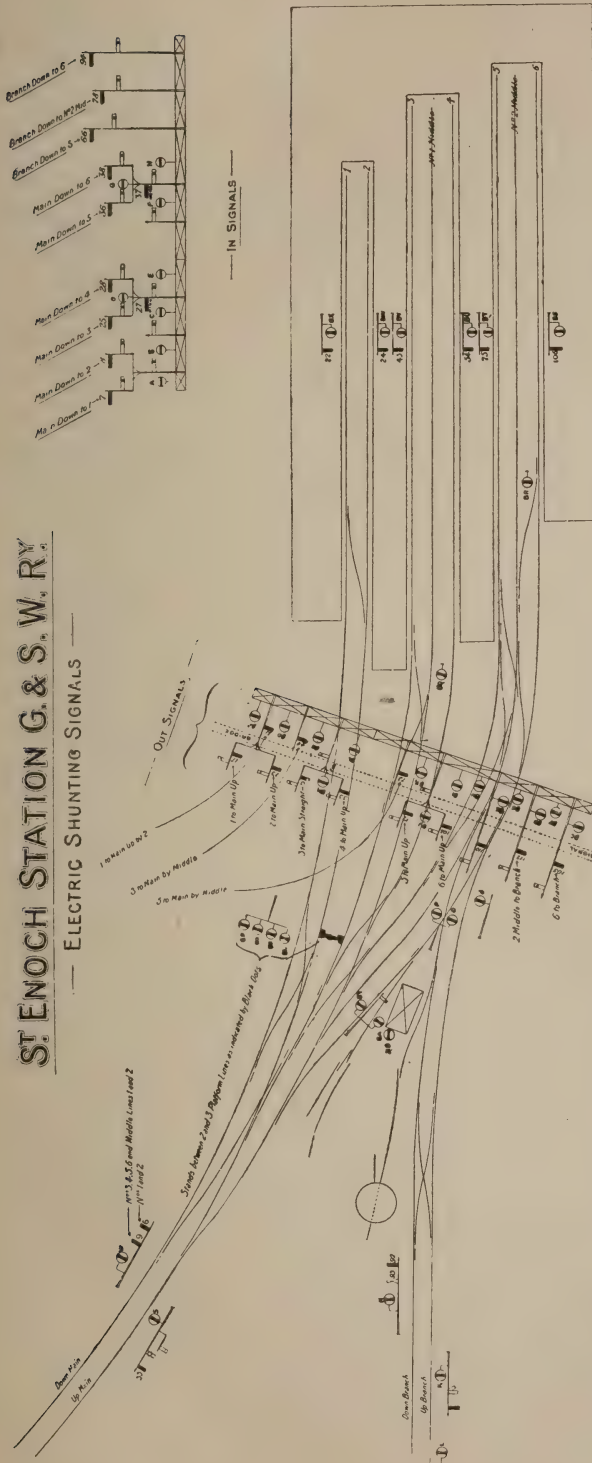
MAP-DIAGRAM SHOWING THE STARTING POINTS OF TRAINS ARRIVING AT ST. ENOCH STATION BETWEEN 8.42 A.M. AND 9.25 A.M.

ling that should be entirely distinct and in addition to the signals used for working the trains in their ordinary booked running. A word or two about St. Enoch Station will suffice to show some of the difficulties that had to be taken into consideration. There are six platforms, enclosing three "bays," two of which have an extra centre line for storing carriage trains. The railway

of about nineteen hours per day, so that the 1,000 movements of trains and engines already mentioned shows, perhaps, almost as much as could be performed in a limited number of hours in any station of a similar size which has only one in and one out road on the main line to work on. To add to the difficulties of the shunting operations, however, at the mouth of the station the path of all in and

ST. ENOCH STATION G. & S. W. RY.

ELECTRIC SHUNTING SIGNALS



out trains is fouled by a line leading to the goods dépôt at College, over which all goods trains for that dépôt have to pass—trains over and above the number already mentioned, and this is also the only road for the interchanging of traffic with the North British Railway for through passenger and goods trains.

Hitherto, under the old *régime*, the shunting operations had been performed with the aid of the ordinary hand-signalling and verbal directions from the signal-cabins. This is all very well for small stations with few complications and little traffic, but in larger ones there is always the very serious liability of such mistakes, for example, as one man thinking the flag which was exhibited for his mate in the next road was intended for him, and *vice versa*.

A similar problem had existed and had been solved on Mr. Cockburn's old line, the London, Chatham and Dover Railway. This was at Victoria Station Mr. W. R. Sykes, the well-known inventor of train-signalling and protective apparatus, was the man who successfully grappled with the difficulty. The problem at Victoria Station, in a few words, was practically to construct a system of signalling for shunting purposes without adding more levers or interlocking ground frames to the already existing signal-cabins. The passenger who journeys out of Victoria to-day may count dozens of small disc signals, but very likely he little knows that they are all actuated by electricity, and that the placing of them required not one additional mechanical lever or any change in the existing interlocking apparatus.

It was to Mr. Sykes, then, that the management of the Glasgow and South Western Railway applied, and the task they set him was to design a system of electrical shunting signals, something after the pattern of those in use at Victoria. But Mr. Sykes has gone a step

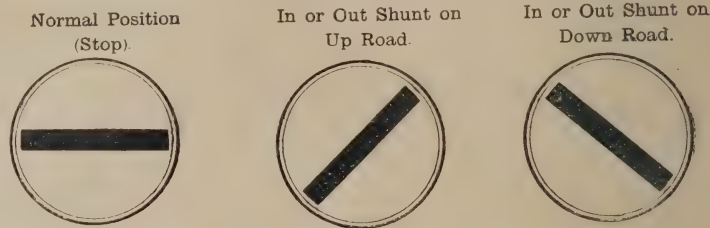
further. Not satisfied with the ordinary disc signal he has invented one which is absolutely unique, and which first appears in railway annals at St. Enoch, Glasgow. His leading idea was that he not only wanted to show the driver that his road for a certain distance was clear for shunting purposes, but also to indicate to him exactly where he was going *after passing the signal*. At the entrance to the station the lines are crossed by a bridge carrying the ordinary semaphore signals—home and starting. Upon this bridge, upon the platform signal posts, and in various other parts of the station at crossing points, etc., Mr. Sykes has placed his new electric shunting signals—forty-five of them in all.

A word or two of description concerning the signals themselves before I go on to state how they are worked.

The signal consists of a circular disc, 2ft. 6in. in diameter and about 5in. thick. The back is composed of opal, the front of transparent glass. Horizontally across the centre is a broad red bar composed of a light framework, upon which is stretched red transparent bunting. This bar works upon a centre pivot by means of two electro-magnets placed beneath the disc. By sending an electric current from the switch in the signal-box into either magnet the bar is depressed either to the right or to the left, and the driver knows accordingly which road is set for him, that part of the bar pointing downwards indicating the right or the left—*i.e.*, the up or the down line, as the case may be. At night a strong light is placed *behind* the disc, and the opal glass and transparent bar cause the signal to appear *exactly the same as by daylight*. This, I believe, is quite an innovation, and a very noteworthy one, too; I am sure it will be generally conceded that a disc which shows exactly the same day and night is an advantage of no mean kind in the simplification of railway signals.

These signals are worked by electric

switches in the signal-cabin, and the point to be noticed is this: No additional levers or interlocking apparatus are at all necessary, the process being as follows:—Suppose, for an example, an engine is to be shunted from No. 6 platform to the up main line. The signalman first “sets the road” in the ordinary manner by pulling the mechanical levers which set the points. He then pulls the “starting signal” lever (from platform 6) two



POSITION OF SYKES' ELECTRIC SHUNTING DISC SIGNAL

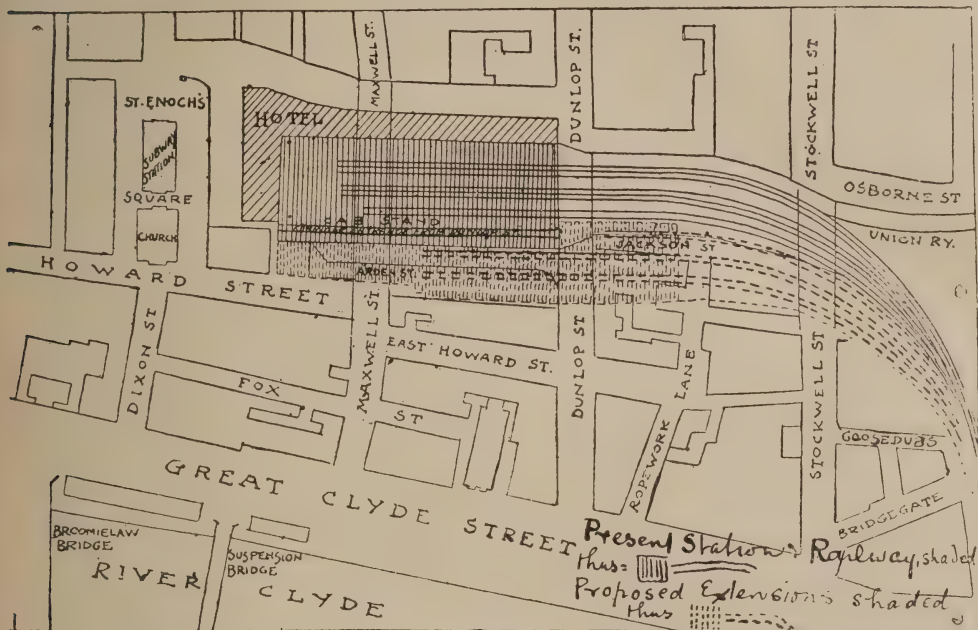
inches forward. Above this lever is a key-switch. He turns it. Instantly a bar drops into a slot in the lever frame and locks the lever itself. The “starting signal” lever being locked, all the points are locked also. Upon the switch are four keys. By pressing these, four currents are set in motion communicating with four disc signals. The driver sees the bar on the signal nearest to him fall to the left. He knows in a second that he is going out on the up road. If the down road were wanted it would first be “set,” the “down” slot inserted in the locking lever, and the “down” switch turned on as above. This would actuate the other electro-magnet below the disc, depress the red bar to the right, and the driver would see immediately that the down line was clear for him to cross to. Some of the signals are put to danger by automatic electric treadles as soon as an engine has passed, but in any case the road is kept “set,” and the mechanical levers immovably locked until the signalman turns off the switch and is then able to release the two inches of the “starting” lever. It might be mentioned that the disc which forms the key-switch is 4in. in diameter, and each key thereon is plainly lettered according to its signal, while the word “IN” on the top and

"OUT" on the bottom tell the man at once to which side he must turn the keys, which latter are in a revolving frame. From this it will be seen that the same switch works a double set of signals on the same road, either "IN" for entering or "OUT" for leaving the station. The keys are automatically turned "off" from contact by simply turning the revolving disc.

When I mention that there are 117

combinations of these 45 signals in working! Each signal is given a distinctive lettering, and a most careful set of directions concerning their position, working, and combinations is issued for use in the signal-cabins. The system came into use on July 3rd, 1898.

It is gratifying to be able to mention that since its introduction the minor mishaps, such as the derailing of engines, etc., to which all big railway stations are more or less



GROUND PLAN, OF ST. ENOCH STATION, GLASGOW

levers in the signal-box at St. Enoch, it will readily be seen what a vast amount of the interlocking, which would otherwise have been necessary, has been saved by the adoption of these electric signals; in fact, the present work at St. Enoch could scarcely be accomplished without their use. Mr. Sykes, who kindly showed me their working, is very enthusiastic over these new signals, and is strongly of the opinion that they would form excellent "distant," or, as our Continental neighbours call them, "advance" signals, on account of their distinctive character. At St. Enoch Station there are no less than 135

liable, have been very materially reduced at St. Enoch, while the trouble which most railways have of designing a shunting signal which, both by day and night, shall be distinctive from a running passenger train signal has been overcome by this clever invention.

Mention was recently made in the RAILWAY MAGAZINE of the smart working of the traffic in and out St. Enoch which is performed every morning between the hours of 8.40 and 9.25. I give a summary of this, and it must again be borne in mind that there is only one up and one down road into the station.

ARRIVALS.

Passenger trains	19
Carriage trains	1
Light engines	10

TOTAL 30

DEPARTURES.

Passenger trains	9
Carriage trains	12
Light engines	3

TOTAL 24

Thus, in 45 minutes 54 engines and trains are worked in and out, with the following average:—

IN	One every 1min. 30sec.
OUT	One every 1min. 53sec.
TOTAL, in and out ...	One train every 50sec.

It would be, I think, extremely difficult to find any traffic working to come up to this, and it will easily be seen that to ensure promptitude and safety the most efficient system of signalling is necessary. Certainly the Company seem to have secured this.

The nineteen passenger trains arriving in the above 45 minutes are as follows:—

- (1) 7.45 a.m. *ex* Greenock.
- (2) 7.35 a.m. *ex* Kilmarnock.
- (3) 8.12 a.m. *ex* Potterhill.
- (4) 7.25 a.m. *ex* Kilmarnock.
- (5) 8.18 a.m. *ex* Renfrew.
- (6) 7.55 a.m. *ex* Ardrossan.
- (7) 8.15 a.m. *ex* Kilmarnock.
- (8) 7.40 a.m. *ex* Largs.
- (9) 8.50 a.m. *ex* Pollokshaws.
- (10) 7.58 a.m. *ex* Ayr.
- (11) 8.25 a.m. *ex* Greenock.
- (12) 8. 5 a.m. *ex* Ayr.
- (13) 9. 0 a.m. *ex* Govan.
- (14) 8.28 a.m. *ex* Greenock.
- (15) 8.10 a.m. *ex* Fairlie Pier.
- (16) 8.53 a.m. *ex* Barrhead.
- (17) 8.55 a.m. *ex* Milliken Park.
- (18) 9.15 a.m. *ex* Bellahouston.
- (19) 8.43 a.m. *ex* Ardrossan.

The plan of these trains will be seen from the diagram on page 3 of this article, which gives the various approaches to Glasgow, and shows at a glance the exact position of each train *en route* and its timing at the intermediate and junction stations.

In addition to the trains shown in the diagram as running over the main line into St. Enoch between the hours of 8.40 and 9.25 a.m. there are three branch trains in and a like number out from the Springburn and Bridgeton Cross branches which arrive at and depart from either No. 5 or No. 6 platforms.

In conclusion, while expressing my thanks to Mr. Cockburn, the experienced and capable Superintendent of the Glasgow and South Western Railway, and Mr. Sykes for the trouble they have taken in assisting me in the compilation of this article, I must say that the Glasgow and South Western is to be congratulated on its up-to-date smartness and efficiency, and that the system of electric shunting signals, which I have endeavoured to describe roughly, forms by no means the least of the inventions for train signalling and train protection brought out by Mr. Sykes. In the August number of the RAILWAY MAGAZINE for 1897 will be found a short account of other apparatus designed by him, and I trust in a future number, when dealing with the subject of "Fog-signalling Appliances," to give some description of a very novel "fogging" machine I saw in the Sykes factory the other day, and which, I understand, will shortly be on trial on one of our chief lines of railway.



PERTINENT PARAGRAPHS

Railways have rendered more services, and have received less gratitude, than any other institution in the country.—JOHN BRIGHT.

THE smartest thing in connection with the deposits of Parliamentary notices for next Session of Parliament is to be found in the Bill deposited by the North Staffordshire Railway. The deposit was made less than a week after the granting of the injunction against the London and North Western Railway, by which trains are compelled to pass over level crossings adjoining railway stations at a speed not exceeding four miles an hour, as required by the Railway Clauses Consolidation Act of 1845. In the Bill just deposited by the North Staffordshire Railway powers are sought to repeal this antiquated clause so far as it relates to level crossings on the North Staffordshire Railway.

* * *

We frequently read in cases of collisions caused by errors on the part of drivers running on parallel lines that they "mistook the signals"—meaning thereby that if, when running on the "slow" road, they saw the "fast" signal "off" they thought it applied to the slow road on which they were proceeding, and *vice versa*. To say "they mistook the 'off' signal" is hardly correct, as in most cases they know the signal refers to the fast or slow road, as the case may be, but for the moment they think they are on the road to which the "all right" signal applies. Therefore, it is apparent they do not mistake the signal, but rather mistake the line upon which they are proceeding. Such mistakes usually occur to trains that do "in and out" running—i.e., part on fast and part on slow roads. What is required, therefore, is some kind of automatic apparatus fixed on the engine, before the driver, showing him distinctly whether he is running on the fast or slow road. Such an indicator would, of course, be actuated by an apparatus connected with the points at the divergence of fast and slow roads. Here is a chance for railway inventors.

* * *

The *plébiscite* taken of all those Socialists

throughout the United Kingdom who could be persuaded to perform the slight manual labour of committing to paper what revolutionary achievements would partly appease their craving for "topsy-turvydom" has revealed the significant fact that only a paltry 3,709 would venture to place "Nationalisation of Railways" in their "practical Parliamentary programme." We wonder if 3,708 even of this small number would have been so audacious had they seen Mr. W. J. Stevens' article in the December issue of the RAILWAY MAGAZINE, in which he shows that the amount now invested in British railways exceeds by £462,000,000 the National Debt, which stands to-day at £638,250,000. Railway shareholders, there is still breathing time before confiscation! We suspect every one of the Socialists would have voted in favour of "free beer," if it had been mooted, yet it is as much within the range of a "practical Parliamentary programme" as the "Nationalisation of Railways."

* * *

In previous issues we have drawn attention to the lack of useful information contained in the half-yearly reports of some of our railways. This is, apparently, no new complaint, for we find in the "Railway Magazine" for 1838—sixty years ago—that Herapath, the then editor, spoke out very strongly regarding the lack of information contained in the report of the Grand Junction Railway. After reproducing the report he proceeds:—

We think our readers will agree with us in feeling much disappointed with this report of the Grand Junction Company. A more puny and more meagre document we have never witnessed. Compare this barren morsel with the report of the Liverpool and Manchester, or with any other report of any company yet published, and see the miserable figure it will cut. If there be no legal, surely there is a moral claim on them for such information. But so extraordinary is this document, dignified with the name of report, that the shareholders themselves are briefly given the gross sum of the receipts, without either details or sum total of the expenses. They are simply told if they carry £14,625, spent

in repairing or making efficient bad engines, to the capital, they can have a dividend of five per cent. for the half-year. With the internal policy of management we have nothing to do, but we must say we think the Grand Junction proprietors an extraordinary body if they rest satisfied with such a report as this. If we did not know that the directory contains many honourable men, we should be inclined to look with some suspicion on their proceedings. We should be disposed to ask, Wherefore all this mystery and concealment? Are you afraid to have your accounts looked into that you conceal them so? Do you expect unfolding the truth will bring your conduct to a discount?

With regard to the public, we hope if this Company ever reappear before Parliament that they will not be allowed to have any amended Bill without a clause being inserted to compel the half-yearly publication of their accounts. Other companies do it voluntarily—the Liverpool and Manchester so handsomely and honourably as to have bound the whole world in a deep debt of gratitude to them for it. Why do not the Grand Junction do the same? We fear there are some elements in the composition of the management as crooked and uneven as the line itself.

* * *

We recently had the fortune to sit at a dining-table covered for our own benefit with a unique damask cloth. Woven into the dinner-table cloth as the pattern were the following:—In the centre a six-wheel "single" locomotive of the period (1845), named "Brunel," with that well-known engineer on the footplate. Above this centre decoration was a wreath of laurels enclosing the following:—"OXFORD, WORCESTER AND WOLVERHAMPTON RAILWAY, AUGUST 4TH, 1845." Below the "Brunel" was a similar wreath, containing the words: "JOSEPH TUCKER, DIRECTOR, 1850." We are informed that one of the directors of the "Old Worse and Worse" Railway was a linen manufacturer, and had table-cloths, such as the one in question, made and presented to each of his brother directors. The one we saw is still in good condition, and is preserved by a daughter of the late Mr. Joseph Tucker. The modern practice of decorating a dining-table would of course hide the pattern woven into the white damask.

* * *

A Scotch County Council is trying to be funny. We read—

Several new bye-laws for regulating public conveyances have been adopted by the Lower Ward District Committee of Lanark County Council. One of these, which was for securing the cleanliness and sanitary condition of railway carriages, was in the following terms:—"Every compartment of a railway carriage in use for the conveyance of passengers shall have the interior carefully dusted and swept out at least once daily, and any cushions or mats

therein shall be properly shaken or beaten at least once daily; and every smoking compartment of such railway carriage shall have the floors and coverings thereof washed and thoroughly cleansed at least once a week."

* * *

Railway companies usually do their duty in this respect without the intervention of such an absurd bye-law, which in all probability is *ultra vires*. Most English railways go further than the above bye-law. The instructions to Great Western Railway carriage-cleaners, for instance (after fully setting out their duties), concludes—

Every vehicle should be cleansed and washed before it commences its first journey in the day; and where it makes more than one trip in the day, it should be swept out before it commences its second and all subsequent trips.

* * *

The joke is, How is the august Lower Ward District Committee of the sagacious and omnipotent Lanark County Council going to enforce its bye-law against the Scotch railways that happen to enter the territory of this self-assertive grandmotherly government? Perhaps by stopping all trains at the frontier of its territory, and having the cleansing carried out under the supervision of its own specially appointed inspectors! Why not make it necessary for passengers to have passports to enable them to travel through the district under the sway of this Lower Ward District Committee of the Lanark County Council?

* * *

A correspondent sends us the following account of a journey to Brighton by the Sunday "Pullman Limited":—

I travelled by the new Limited Express between London and Brighton last Sunday, and was much astonished at the interest taken in the train both by the outside public and by the passengers themselves. At every station, and at every point along the route from which a view of the railway could be obtained, were congregated little groups of people eagerly looking out for us, and this in spite of pouring rain south of Croydon. The passengers themselves discussed the chances of our arriving in time, as though it were an affair of national importance. It was amusing to notice the furtive manner in which watches were pulled out by those few superior persons who considered that it was *infra dig.* to appear interested in anything so plebeian as a mere train. A crowd of some 300 people had assembled at Brighton station to await our advent, and great was the disappointment when we arrived six minutes late, a fact attributable largely to the slippery condition of the metals.

The driver was besieged by questions, and nearly wept at his failure. However, there was some consolation for him in the reflection that on the previous

Sunday he had arrived two minutes before his booked time. I append our log:—

Victoria	dep.	11.0 a.m.
Clapham Junction	pass	11.4
East Croydon	"	11.16
Redhill	"	11.29-30
Hayward's Heath	"	11.50
Preston Park	"	12.3
Brighton	arr.	12.6
Engine "Trevithick." Load, 6 Pullmans and 2 brake-vans.		

* * *

The exhaustive article published last month, dealing with the South Eastern and London, Chatham and Dover Railways, under the title of the "Great Southern Railway," has been further supplemented by the publication of the Parliamentary Notices for next Session, in which, under the title "South Eastern and London, Chatham and Dover Railways, New Lines, etc.," power is sought to connect the existing lines of both Companies at five points—viz., near Bromley and Chiselhurst, Otford, Margate, Whitstable, and near Broadstairs and St. Lawrence. These connections partially carry out the suggestions made in the article referred to. The geographical position of the two railways, which, in a few weeks, will merit the title of the "Great Southern Railway," is familiar to most travellers and all readers of railway literature, but it may be news to some to be told that the combined railways will have a length of more than 620 miles, and will comprise three leased properties, one worked line, two joint lines, and two-sixths of a leased line—the East London Railway. These are as follows:—

	Miles.	Chains.
South-Eastern owned lines	382	57
London, C. and D. owned lines	189	35
Dover and Deal (formerly joint) owned lines	8	44
Total owned by "G.S.R."	580	56
Croydon, Oxted, and Woodside lines, owned jointly by S.E. and L.B. and S.C. (one-half)	7	28

LEASED LINES.

London and Greenwich Railway	3	57
Cranbrook and Paddock Wood Rwy.	11	15
Chipstead Valley Rwy.	5	60
Angerstein Wharf Branch	—	73
Total leased by "G.S.R."	21	45
Worked railway—Bexley Heath Rwy.	8	66
Two-sixths of East London Rwy.	1	64
Total	620	19

* * *

Power has been sought in next Session to

absorb the Chipstead Valley Railway, so that the number of leased properties will be reduced should the Bill pass.

A train service from Victoria (London, Chatham and Dover) to Hastings, viâ Sevenoaks and Tonbridge, is already advertised; this would be about four miles longer than the present South Eastern route and about eleven shorter than the Brighton and South Coast, so it may be reasonably expected that the presence of a Hastings train in another part of Victoria Station will spur on the Brighton management to accelerate their St. Leonards and Hastings service. The fastest down train over the South Eastern takes 1 hour 49 minutes, and that by the London, Brighton and South Coast (in summer) 2 hours 3 minutes. The run from Victoria to Lewes could easily be made in 65 minutes, and thence to Hastings, not entering Eastbourne, in 40 minutes more, in all four minutes less than the present fastest South Eastern train. But it is hardly possible as yet to forecast the many advantages that are likely to accrue to the travelling public from the "Great Southern" consolidation.

* * *

We have received an artistic folder with coloured half-tone illustrations of the Sanyo Railway Company, Limited, of Japan, printed in English by K. Ogawa, Tokio. The pamphlet is evidently got up for the benefit of American tourists, as we read—

"It is now conceded that in America the art of railway management has reached a higher state of development than elsewhere.

"The management of the Sanyo, in the adoption of the latest modern inventions and appliances, has taken America for its model, with the result that more attention to the comfort and convenience of travellers may be found on its line than on any other part of the railway system of Japan."

Later on we are informed—

"In the winter season the first and second class carriages are well provided with heaters, while at all seasons electric lamps on the night trains have superseded the clumsy and noisy English system of car lighting."

* * *

If England is so behindhand it is a pity the Sanyo Railway is not a railroad, and that the directors and officers, who are all Japanese, have reproduced a photograph of an English locomotive as the principal illustration for the pamphlet.

The special features promised by this

Japanese railway are also decidedly on English rather than American models. They include—

The ticket offices are always open during the day and evening, travellers being thus saved from the exasperating annoyances constantly happening on the other roads in Japan from the brief allowance of time given for the purchase of tickets.

Special tickets, good for ten days instead of for the date of issue only, are available for the convenience of travellers.

On long routes return tickets at half rates are furnished, if desired.

Large special discounts are made for parties and schools.

Passengers can be booked for Osaka or Kioto without change of cars, and arrangements will soon be made also for through cars to Tokyo.

Platform tickets, securing entrance to the platform only, are available at the chief points on the line.

At all the principal stations, porters (known by their red caps) are always on duty to assist travellers in carrying their luggage.

A special and most welcome feature in the management of the road is the provision for furnishing *first class* lunches at all necessary intervals. Arrangements are made (without expense to the traveller) for telegraphing for these, so that on arrival at the refreshment stations they are at once furnished, warm and palatable, put up in dainty boxes and provided with all necessary accessories. In the preparation of these lunches, care is taken to cater to the taste of foreigners as well as to that of the Japanese, and thus for the former, one of the greatest hardships incident to railway travelling in Japan is done away with.

* * *

In our issue of August, 1898, we stated that the Western Railway of France was about to decorate the exterior of carriages with various designs for the purpose of assisting absent-minded passengers to better identify their carriage at stopping stations when seats are temporarily vacated, the carriages bearing different designs, such as elephants, rams, snakes, etc. The drawbacks to the system, which we drew attention to, have already developed. We read that an American traveller, who had been having a good time, got out at a refreshment-room station to "see a man," and on his return, on examining the carriages to find the one in which he had travelled, observed the signs referred to, which he had overlooked in the hurry of joining the train. He rushed excitedly from the station under the impression that he had "got them" badly again, and was with some difficulty prevailed upon to take his seat.

* * *

"Williams," said the stationmaster at a country station, "you have been three times

late on duty this week. How is it? You seem to offer no explanation."

"Well, sir," stammered Williams, "you see the missus has had twins."

"Twins! Bless the man, why did you not say something about it?"

"Because my mates told me, sir, that men in the traffic department were not allowed increases without the superintendent's authority!"

* * *

At a Yorkshire station a porter, who was the night man on duty, accidentally fell asleep and missed attending an excursion train which arrived in the station soon after midnight. On a report of the matter reaching the stationmaster, the porter was called upon for his explanation. This he gave, stating that he had been kept awake every day when he should have been in bed with the toothache. On this particular night he had taken some laudanum to ease the pain, and it had sent him to sleep.

The following reply was sent from the district superintendent, on the report reaching him:—"Please caution Porter R— against using laudanum in future when on night duty, but it would be an advantage if he always had the toothache."

* * *

A train had just started from a Great Northern Railway station, and a gentleman was about to jump aboard, when the guard ran up, and, pulling him back, said:

"Why, I probably saved your life, sir. It's most dangerous to get on a train when in motion."

Presently the guard's van came along, and the guard was just gliding in in that graceful manner peculiar to those men when the aforementioned gentleman rushed up and pulled him by the coat-tail, exclaiming:

"You saved my life, guard, I must save yours!"

That guard's face, as the train went off to Peterborough without him, was a picture to behold.

* * *

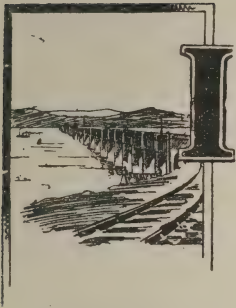
"Why the deuce don't you sing out the names of the stations clearly?" said an irate railway passenger to a London and North Western Railway porter the other day, who had just delivered himself of a string of unintelligible gibberish.

"Golly!" exclaimed that individual, "ere's a cove as expects hopera-singers for a porter's wages!"

"THE RUTHERFORD RAIDERS"

By D. T. TIMINS, B.A.

Continued from page 476, Vol. III.



I WAS not much afraid of official pursuit, however, for even if the police suspected—which was very doubtful—that I had escaped in the 'Marathon,' they could but await her arrival at

Amsterdam, and Captain Hargreaves would not make that port until 9 or 10 o'clock the same night, for of course he must not appear to have done the passage at any greater speed than his regulation ten knots an hour. But what about my other pursuers? They knew that I was on my way to the Continent, and, though baffled once, would assuredly not give up the chase. They could not, however, leave England before the 9 a.m. service to Berlin via Calais next day, and I should be in St. Petersburg a full twelve hours before them.

"My meditations were interrupted at this point by a violent application of the brakes and a peculiar grinding and grating sensation. With a series of jerks the train drew up at a long unlit platform. What was the matter? Signals against us? I leaned out and saw the guards and engine-driver in earnest colloquy. I descended to the platform and soon learnt the truth. The engine had run short of water, and there would be a delay of some twenty minutes whilst the nearest bank engine was fetched. This additional check was not of sufficient duration to cause me to miss my train in Berlin; so, free from anxiety on that score, I walked up and down the deserted station, whose name I made out to be Dollbergen, in solitary grandeur.

"Everybody else in the train appeared to be asleep, the screens being drawn over the lamps in nearly every compartment and the blinds pulled down. Very ghostly did the darkened carriages look in that silent station. The only light visible came from the telegraph office at the extreme end of the platform. I strolled up to it and looked in. A woman was the sole occupant, and from the silence of the instruments I judged that she was by no means busy. Suddenly, however, a bell rang and one of the needles commenced to click. More from curiosity than anything else I listened. I am, as of course you know, my dear Walter, perfectly acquainted with the Morse code. In an instant my attention became painfully riveted, for this is the message which the instrument spelt out:—

"Warn signalmen to clear line for special train Calais to Berlin. Very important. Hanover."

"This was pursuit in deadly earnest! I had no shadow of doubt but that the special train had been chartered by the York swindlers or their agents. There was no time to be lost. Already I could hear the whistle of the approaching bank engine. Unless I could hit on some plan whereby to delay the special train its occupants would reach Berlin in time to catch the 9.2 a.m. thence to St. Petersburg, by which I myself intended to travel. I looked round. There was not a soul on the platform, save the two guards, who were at the other end of the long train superintending the coupling up of the bank engine. The special could not be more than fifteen miles distant, and it was exceedingly unlikely that anything else would pass

over the metals after our departure before it arrived. The last vehicle of our train was a luggage truck and was not fitted with the vacuum brake. Between this truck and the rear guard's van there were three freight vans. Stretched over the last truck was a tarpaulin fastened down by a thick cord. I managed to cut off a length of this, and uncoupling the truck as silently as I could, I connected it by a double cord to the next van. I then took up a precarious position on one of the buffers of this van, and clinging to the unused brake-pipe waited for the 'right-away' signal.

"My one fear was lest the train should start with a jerk and break the cord, in which case it would mean the hopeless failure of my plan. Fortunately we started very gently, and directly we were clear of the platform and sidings I made a dangerous expedition over the top of the truck and obtained possession of the tail-lights, which I placed in position on the van. I then cut the cord, and the truck immediately fell behind and began to gradually slow up. Obviously I should have been unable to uncouple the truck whilst the train was in motion owing to the tension on the draw-bar. At Gardelzen I slipped off unperceived and regained my compartment, the other occupants thereof being so sound asleep that they scarcely noticed my entrance.

"We reached Berlin very late, but still with half an hour to spare. Some of the most anxious moments of my life passed during the

wait at the Friedrichstrasse Station, lest after all my ruse should have failed, and it was not until the Eydtkuhn train steamed out of the station at 9.2 a.m. punctually, without any sign of the arrival of the special from Calais, that I again breathed freely. The loss of the truck had not been discovered before our arrival in Berlin, and though the officials

must be aware of it by now, they evidently did not suspect any of the passengers as being concerned in the matter.

"At Königsberg an evening paper which I bought contained the following brief telegram:—

"A special train from Calais to Berlin went off the line early this morning between Dollbergen and Jsenbüttel. It is believed that it ran into a loaded truck, whose presence on the line is hitherto unexplained. Driver and fireman badly injured."

"So I had succeeded after all. Whether or no any of the passengers were hurt as well the telegram did not state.

"Next day, at 7.30 p.m., we reached St. Petersburg. It was then far too late to obtain audience with the War Office officials, so I drove straight to the Sergiefskaya quarter, where, in the Pozki Prospekt, was situated the private residence of Mgr. Anton Strelvetski, the Minister of State for War.

"A massive stone house it proved to be, standing back from the road, and protected by heavy iron gates opening on to a well-kept drive. My knowledge of Russian is limited,



"He conducted me down a long, dark platform"

and it was only the persuasive influence of several roubles upon the stolid Slav who opened the door that finally induced him to lay my request for an immediate interview before his master. 'Such a thing was unheard of. Mgr. Anton Strelvetski was with his family. He could not disturb him. I must call to-morrow,' etc., etc. However, I finally overcame his scruples by the above-mentioned means, and after an astonishingly short absence he returned to say that his master would see me at once. The servant was evidently most favourably impressed with my importance from the promptness with which his master had granted me an audience, and it was with a very obsequious air that he ushered me into Mgr. Strelvetski's study.

"A tall, fine-looking man of about forty years of age, whose massive forehead spoke eloquently of his intellectual power, was seated writing at an *escritoire*. He rose and bowed slightly as I entered. The servant having withdrawn, he said in excellent English:

"I was expecting the honour of a visit, but must congratulate you on the promptness with which you have paid it."

"A cold shudder ran through me at these words. Was I too late? Had Schuler's gang contrived, by some extraordinary means, to outwit me? Taken by surprise, I stammered out:

"How can that be, Monsieur, for the object of my visit is a secret one?"

"Strelvetski laughed slightly.

"Do you think we are unacquainted with what goes on in England at this important crisis?" he asked. 'I receive a telegram in cipher notifying me that certain important documents have been stolen from the English Government, and that they are not in the hands of our representatives. To whom are they of value besides to the English? Obviously to us alone. Three days later I receive a mysterious visit from a disguised Englishman, who insists upon seeing me, and will take no denial. Why do you start? Do you think that your disguise can deceive a man who served for twenty-eight years in the Russian secret police? What is the inference?

What conclusion would any sane man draw from this sequence of events?' He leaned back and looked at me. I saw that I had better make a clean breast of it.

"Yes, M. Strelvetski," I replied, 'you are right. I have possessed myself of certain papers, the value of which are incalculable to your Government—you evidently know to what papers I refer—and I ask you, what is your price?'

"Before we discuss that question," replied Strelvetski, quietly, 'let me ask you, in return, of what value are those documents to you? Your only hope is to sell them to us. You cannot return to England for fear of arrest; and, save in Russia, your wares have no market value!'

"I was somewhat staggered at this view of the case, but nevertheless I replied firmly:

"Though the documents are of no value to me by themselves they are valueless without me. I did not bring away much on paper, but I have priceless information stored up in my brain. For 100,000 roubles I will make everything clear to you."

"Before we go any further," said the Minister, 'I shall require some proof that you are not merely an impostor, but are actually in possession of the information you claim to be.'

"Willingly," I replied, and forthwith proceeded to demonstrate to Strelvetski my knowledge of the great defence scheme in all its details.

"Very good," he said, when I had finished; 'I am satisfied that you really are the man who stole the papers. But your terms are too high. Now that the English Government know that their secret has been discovered they may change their plans. Evidently you are an expert in railway matters. You cannot return to England. Will you accept 50,000 roubles down, and a post on our Trans-Siberian Railway works?'

"The upshot of the matter was that I consented to his terms, and the next two days were spent in private conclave with the highest officials of the State, whilst I reproduced for them all the details of the English scheme.

During that time I never went outside the Government buildings, and on the evening of the third day I was to leave St. Petersburg for Samara, viâ Moscow, there to join a railroad surveying party which was on the point of starting for Siberia. I drove to the Moscow station, which is at the east end of the Nevski Prospekt, with the intention of catching the 9.30 p.m. express. It was barely nine o'clock when I stepped out of the droschky. An official at once came forward, and, saluting, said, 'This way, Monsieur Caley' (the name which I had assumed in St. Petersburg). Thinking that the man had been told off to look after me, I unhesitatingly followed him. He conducted me down a long, dark platform to a carriage standing by itself, with an engine attached, and with many bows ushered me into a compartment already containing one other passenger. Before I had time to remonstrate, or ask for the sleeping car in which I had intended to travel, the door was slammed, and to my amazement the train immediately started, and began to get up speed at a great rate. This was curious, to say the least of it. We were not really due out for another twenty-eight minutes. Moreover, the compartment I was seated in formed part of a single carriage. The train could not by any possibility consist of one vehicle only. We must be shunting. The train rattled through a suburban station. This did not seem consistent with the shunting theory. I just caught sight of the name 'Vrinska.' Surely that station was not on the Moscow line? It was on the way back to Eydtkuhnen.

"I must be in the wrong train. I had never made such a mistake in my life before. And yet I knew that there was no train due to leave St. Petersburg for Eydtkuhnen at that time, and, moreover, in any case, such a train would have started from a totally different station.

"I turned round to question my fellow-traveller. His eyes met mine. He was the dark handsome man who had been my interrogator in the underground cell!"

* * * * *

The chapters in Williamson's MS. which immediately follow the "History of the Diverted Express" are not of very great interest, though it is necessary to briefly summarise their contents.

It seems that Williamson's companion in the diverted express was indeed none other than James Mortimer, the infamous head of the York gang. There was no doubt that, having got Williamson into his clutches by the simple expedient of decoying him into a special train and bribing the station officials to carry out his (Mortimer's) orders to the letter, he intended to make away with the man who had thus far outwitted him. A murderous fight took place between the two, in which, however, Williamson, thanks to his enormous strength, overpowered the other. In consequence of this totally unexpected development of affairs the tables were completely turned, and Mortimer found himself at Williamson's mercy. As each of them had now paid the other the doubtful compliment of attempting his life, they agreed to call it a drawn battle and to compromise matters.

It appears that the police had managed to trace Williamson to Schuler's den, which, after the disappearance of the former from Newcastle, they promptly raided. As a result the gang were forced to fly for their lives, and Mortimer found himself virtually exiled from England. He at once set out in pursuit of Williamson, and, after the failure of the chase by sea, he hurried to London, and, crossing by the day Continental mail, chartered a special train from Calais to Berlin in the hope of overtaking my quondam friend. This train was wrecked, as Williamson has narrated, but his pursuer escaped without injury. Williamson doubtless owed his life to the fact that, until the night of his departure from St. Petersburg, he never went outside the Government buildings. In the end matters seem to have been settled amicably between them, Williamson and Mortimer agreeing to enter into a partnership for mutual profit and to take into their confidence two other members

of Schuler's gang also. This quadruple alliance really formed the nucleus of that band of criminals who were afterwards known as "The Rutherford Raiders."

After bringing several minor coups to a successful issue, I find that the first big affair in which this precious association engaged is described by Williamson under the title of

"THE RAID UPON THE P.L.M. TOGETHER WITH THE HISTORY OF THE CHANGED CROUPIER."

"You will remember, my dear Walter, that after the little affairs in Northern Italy, which I have severally described under the titles of 'The History of the Phantom Locomotive,' 'The History of the Disappearing Platform,' and 'The History of the Dummy Special,' Mortimer and I were compelled to re-cross the Italian frontier. As we had in contemplation an expedition for our mutual advantage into Egypt, we were unwilling to proceed further westwards than we were actually obliged. We therefore took up our quarters in the Hotel de Paris at Monte Carlo, Mentone being unanimously voted too dull. Our party consisted of Mortimer, Edward Ryland, and myself, the fourth member of our association, Harrison Treadway, being ensconced in Paris. Ryland, however, did not accompany us to the Hotel de Paris, but was located at the Hotel Windsor. We did not wish it to be known that he was an associate of ours, in case we should need his help in any matter during our stay at Monte Carlo. I had grown to like Mortimer. He was, without exception, the most reckless and unscrupulous man whom it has ever been my lot to meet. A gentleman by birth, he possessed both culture and refinement in a very large degree, and up to the present time he had given no sign of the existence of that vein of diabolical cruelty which I nevertheless knew lay hidden in his nature. Without possessing the finesse and power of attention to detail which have always been manifest in my work, Mortimer was nevertheless capable of evolving daring and original schemes. The man's knowledge of electricity and magnetism was simply prodigious. Single-handed he had invented and constructed all the complicated and delicate electrical machinery which I had seen in the

underground cellar. The travelling cage in which I had been immured, and the electric boat which had carried me down the subterranean river at a speed of 34 knots were both products of his fertile brain.

"A very different character was Edward Ryland. A little, short, narrow-shouldered man of about forty, with a puffy face and eyes like a ferret's, he had only one point to recommend him, and that was his unswerving allegiance to Mortimer. Whatever orders Mortimer gave he blindly obeyed, and I verily believe would have put his head into a lion's mouth had he been so commanded. This fidelity was the result of a most awful terror which he entertained for his leader. And you will readily admit that he had good reason for his fears, seeing what fearful displays of Mortimer's fiendish cruelty and ferocity he must at different times have witnessed.

"I will give you some account of Treadway later on; with the events recorded in this chapter he had nothing to do.

"The length of our stay in Monte Carlo was uncertain. We had made a good thing out of our partnership so far, and had therefore no scruples in playing freely. Both being gamblers by nature, we spent a good deal of our time in the rooms. Though it was early in the season, and the English contingent had not as yet appeared in force, the Casino was always fairly well filled. The reckless plunging of the young Prince of Roumania, and the extraordinary run of luck with which he had hitherto been favoured, furnished the particular sensation of the hour. As the gentleman in question sat close to us at table d'hôte every evening we had abundant opportunities for observing him. Of middle height, dressed always in the uniform of an officer of the

Roumanian army, this young gentleman—for he could not have been more than five-and-twenty—presented all those features of outward polish and refinement with which Roumanians are wont to mask their semi-civilised savagery.

"The Prince's movements were characterised by the most perfect regularity. Punctually at

round to watch the operations of the Royal punter, for, apart from his high play, it is a very unusual thing to see a man who gambles in very large sums systematically playing roulette. Professional gamblers usually patronise the "trente et quarante" tables, because the odds at that game are slightly more in favour of the punters.



"Mortimer and I were wont to amuse ourselves by watching the play of Prince Ferrand"

seven o'clock every evening he sat down to dinner. At 7.45 he called for his bill and a liqueur—all Monte Carlo hotels enforce immediate payment for everything supplied—and at three minutes to eight precisely he walked across to the Casino. From eight o'clock until five minutes to eleven he sat at the first roulette table on the right as you go in, steadily staking the maximum on every spin of the ball. A crowd always gathered

"In common with the rest of the crowd, Mortimer and I were wont to amuse ourselves by watching the play of Prince Ferrand. Often did Mortimer sneer at the complacency with which the bank bore its enormous losses.

"'They know they'll pluck their pigeon eventually,' he remarked to me one night when the Prince had won more heavily than usual 'Why can't they do it at once? If I could get hold of a roulette board for an hour I'd

guarantee that before the night was out our friend Ferrand would have to walk back to Roumania! He'd never stop until he lost his last sou.'

"I have heard that it's only the fact of the eyes of the sharpest scoundrels in Europe being upon them that keeps the croupiers honest,' I replied. 'You could never make a board play untruly without being discovered, and then the Lord help you! I don't know who'd treat you the worst, the cocottes or the roués.'

"Mortimèr smiled. 'The cleverest gambler in Europe would never suspect there was anything unusual in the table if I once had a chance of doctoring it,' he said. 'But it's no use waiting here. Let's have a little flutter on our own account.'

"Some evenings later an event occurred which brought the above conversation back to my mind. The rooms were very crowded, for there was a rumour that the Prince of Wales might be present, as he had been cruising in the Mediterranean and his yacht had anchored in the harbour at Villefranche two days previously. Somehow or another Mortimer and I got separated in the crowd, and I hunted for him in vain for upwards of half an hour. At last I spied, as I thought, his tall figure pushing its way through the people. By dint of superhuman exertions I struggled up to him and touched him on the shoulder.

"Run to earth at last!' I said triumphantly.

"Pardon, monsieur, que voulez-vous?' said the man whom I had addressed, turning round politely.

"Completely dumfounded, I stammered out some words of apology. It was a most extraordinary thing. The face and figure were Mortimer's, and the voice differed but very slightly from his. I had never seen such a remarkable instance of a 'double.'

"Evidently amused at my perplexity, the Frenchman bowed slightly and passed on. At the same moment I was clapped on the back, and, turning quickly round, found myself face to face, with the real Mortimer.

"Where the blazes did you get to?' he

exclaimed. 'I've been hunting for you everywhere. What the deuce is the matter, man? You look as though you'd seen a ghost!'

"I believe I have,' I answered, 'or, at any rate, your twin brother. I have just spoken to a man whose back view I certainly mistook for yours, but whose resemblance to you when he turned round was perfectly uncanny. Why, the very face and voice were the same!'

"Nonsense!' said Mortimer; 'I never had a brother. I should like to see this marvellous personage who has had such an effect upon you. Which way did he go?'

"Over there,' I replied, pointing in the direction in which the Frenchman had disappeared. 'We'll try and follow him up.' But though we searched everywhere we failed to discover the object of our quest until we were leaving the rooms.

"We had just paused for an instant on our way out to watch the Prince place his last stake for that night when my eyes fell on the croupier at the board. I gave a start and clutched Mortimer's arm. 'That's the man!' I whispered, excitedly; 'there—the man spinning the ball!'

"By Jove!' whispered Mortimer back; 'you're right! So far as I can judge, he's the living image of myself—and in voice, too!' he added, as the croupier called out, 'Faites vos jeux, messieurs; dernier coup!'

"I've got an idea!' I said in a low voice. 'Come on—let's get out of this quickly!'

"I hurried Mortimer away from the Casino, across the road, and straight up to our room in the hotel. Having double-locked the door, I proceeded to unfold my plan to him, which was briefly as follows:—

"Firstly, that we should make away with or suppress Mortimer's 'double' for one night, and that Mortimer himself should impersonate the missing croupier.

"Secondly, that he should so tamper with that particular roulette board as to make sure of winning an enormous sum from the Prince of Roumania; and, lastly, that we should jointly seize on the whole of the day's winnings as they were being carried from the Casino to Smith's Bank in the Galerie Charles III.

"Mortimer was naturally somewhat staggered at the magnitude of the scheme, and also rather sceptical as to the possibility of carrying it into effect; but the more we discussed it the more anxious we became to try and bring off such a tremendous double coup. The whole of that night was spent in talking the matter over, and we soon decided wherein our principal difficulties lay.

"I forget, my dear Walter, whether you know anything about Monte Carlo; but, in case you should not do so, I will describe the procedure of the Casino authorities as regards the safeguarding of their winnings and the prevention of fraud during play.

"Every morning the roulette boards are mathematically tested and new cloths stretched on the tables. The croupiers work in four-hour shifts, and are relieved at the end of that time. Besides the special referee who sits behind the man in charge of the board there are officers and detectives all over the rooms. Moreover, the punters, comprising as they do the most noted 'sharps' in Europe, are the most effectual check of all on anything in the nature of unfair play. At the end of the day the money is collected from the tables, locked up in a strong-box, and conveyed to Smith's Bank under an escort of soldiery. You will therefore readily understand the enormous difficulties which there were in the way of successfully carrying out our plan.

"But at the end of a few days it appeared more feasible. Mortimer had no difficulty in buying a roulette board exactly similar to those in use at the Casino, and this he proceeded to work upon as follows. Removing the bottom, he placed a piece of soft iron under each number, these pieces being prolonged like the spokes of a wheel until they met under the centre of the board. By leaving two opposite pairs of spokes unconnected with those adjacent to them he divided the board into two metallic halves, the numbers in each half being all connected together. Above the division between the two halves he introduced insulators, painted so as to exactly resemble the rest of the board. He next joined each

half to the poles of a small but enormously powerful electrical accumulator, and so arranged the wires that by moving a switch the current would pass through either half of the board at will, thereby converting that particular half into a tremendously powerful electro-magnet. He then prepared several balls of exactly the same size and weight as those actually used in the Casino, but constructed of thin copper. Naturally these balls would finally roll without fail into a number upon the magnetic side of the board, the actual number being, of course, immaterial. Thanks to the Prince's rule of staking upon one number only, and never upon the dozens, colours, carrés, or any of the other chances, he could not fail to lose every time if Mortimer so willed it. The switch was worked by slightly turning one of the balls by which each of the revolving arms is terminated. As this could be done whilst performing the ordinary motion of revolving the board, and as it by no means followed that it would be necessary to alter the switch for every spin, it was impossible for the sharpest eye to detect anything unusual either in the appearance of the board or in the method of its revolution. To change the spinning ball provided by the Casino for one of Mortimer's little copper spheres would be a very simple act of *legerdemain*.

"Moreover, Mortimer's board was capable of standing every one of the tests which are diurnally made by the Casino authorities, and when the bottom was finally replaced there was absolutely no sign of the terrible mechanism hidden within it—terrible because it constituted a force against which no gambler in the world could successfully play! We had not overlooked the fact that there would be a great deal of money upon the table besides that of the Prince; but, seeing how small the amount must be when compared with his huge stakes, and that there is always a 3 per cent. chance in favour of the table over and above the true mathematical odds, we naturally did not trouble ourselves much on that score.

(To be concluded.)

ELECTRICITY'S CONTRIBUTION TO THE SAFETY OF RAILWAY TRAVELLING

By F. T. HOLLINS, *Telegraph Engineer and Superintendent, Great Eastern Railway*



AS the mighty engine of the night express is rushing along with its human freight through the dark and stormy night, few of the comparatively comfortable passengers aboard know of—or, if they know, give that credit which is due to—the silent electric

messenger that speeds faster than they to tell of their coming; to warn all whom it may concern, miles in advance, to be ready and to clear the line; to have everything safe and to lower the signals to allow them to pass in safety without pause or delay. And yet this silent messenger, electricity—this hand-maiden, as it has been called, of the railway king—is ever busy, ever ready to facilitate, to secure, and to expedite us on our way day and night. Without the aid of electricity such rapid and quick following trains would be an impossibility.

The object of this article is to tell, in simple, popular language, something about the practical part which electricity plays, by

means of up-to-date apparatus, in directing and controlling the business of, and signalling and protecting the trains on, one of the principal railways running out of London—*i.e.*, the Great Eastern Railway.

I suppose it may fairly be claimed that Liverpool Street Station, with its eighteen platforms and some 130,000 passengers per day, is *one* of the largest and busiest, if not *the* largest and busiest, of railway stations in the world. With an average of considerably over 1,000 trains per day in and out of this station,

some little information as to the part which electricity plays in assisting in the regulation and protection of such a large number of trains may, the author hopes, be in some degree interesting.

To make this article as clear to the general reader as is possible upon such a technical subject, it will be necessary to briefly explain the different forms of signals and their appearance, and how they are worked and controlled, in order to regulate and safely guard the passing trains.

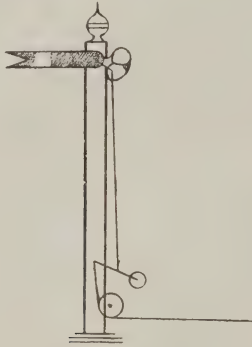
For the purpose of working the traffic on a railway it is necessary to divide the line into sections of convenient length, varying



MR. F. T. HOLLINS
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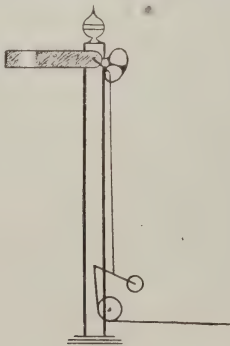
inversely in proportion to the traffic; and to mark these points of division a signal-box is provided. The length of line, whatever it may be, between two boxes is called a block section.

There are (leaving out all other special sidings and station signals) two classes of signals—the “caution” or “distant” signal and the “stop” signal—which may either be a home signal, a starting signal, or an advance starting signal. A train may always *pass* a distant signal at danger, but must be sufficiently under control to stop before or at the next signal, which will be a stop signal. A distant signal is always known by its being forked at its free end, thus:—



DISTANT SIGNAL

and a stop signal (that is, a home or starting signal) is known by its square end, thus:—



STOP SIGNAL

The right side of all signals—that is, the side facing an approaching train—is usually marked with a white disc on a red ground,

and the wrong side a black disc on a white ground, and all signals have their arms pointing to that side of the line occupied by the line of rails to which they refer; therefore, they are known not only by their colour but by their direction. By night the signals are recognised by a red or green light facing approaching trains. Hence for a simple up and down line there is no confusion or mistaking of the signals.

Now all signal arms, being heavily weighted to the danger position, are connected with strong strand steel wire, operated by levers in the signal-box; and there are also similar levers to operate, by means of iron connecting rods, the points for diverting trains from one line to another as may be required.

In connection with these levers in the signal-box there is a system of *mechanical* interlocking of one lever with another, so that it is impossible for a signalman to pull over or operate conflicting signal levers or conflicting point levers. The iron or steel bars or rods locking and interlocking one lever with another are so arranged that the lever for setting the points right for an approaching train must be pulled over *first* before the signal lever can be moved to take the signal off; and the pulling over of any particular point lever ensures that only the signal levers which it is right to pull over for a train to come over these points can be operated. The act of pulling such signal levers over puts a slot or lock in, and holds fast all the other signal levers which are *not* to be used.

Again, referring to the distant signal. As before stated, this signal is really only a “caution” signal—that is, a train is not called upon to stop at it even though it is at danger. It is intended, when in that position, as a caution and advice to the driver to be ready to stop at the next signal—the home signal. This distant signal lever is mechanically interlocked also with the home or stop signal lever, so that the latter, after the points (if any) have been set, must be pulled off *first* before the distant signal can be lowered, and therefore the driver, on passing the distant signal, knows, if *it is* off, that the home signal or

stop signal ahead *must* be off—that is, providing nothing arises to induce the signalman to again put it to danger; so that we see every signal-box in itself is very well provided with checks against mistakes being made by pulling conflicting signal or point levers, and everything is therefore 'perfectly safe' providing the signalman never operates any of his point and signal levers *except when it is right and safe for him to do so.*

And here steps in electricity to aid him, to remind him and to control him. It was formerly the practice to pass the trains on from signal-box to signal-box by interposing a time interval at each box. That was so that after a train had passed any one box five or

One dare not think what would be the result to trade and the national wealth. And yet electricity, this handmaid of railways, in her many and various applications and combinations is undoubtedly entitled to a very large if not the largest share of credit for the magnificent transformation of our railways, in this respect, from what they were forty or fifty years ago to what they are to-day.

Instead of a time interval between the trains a system of electric block telegraph was then established between each signal-box to enable the signalmen to rapidly communicate with each other, and so signal the trains forward from one box to another, and to advise each other as the trains passed them by electrical,



A GREAT EASTERN RAILWAY SUBURBAN TRAIN PASSING STRATFORD JUNCTION

ten minutes interval or more, according to the length of the section, would be allowed to elapse before another train was permitted to follow it. And then it was absolutely necessary to proceed cautiously, and keep a sharp lookout lest any unforeseen circumstances should have interposed to stop the preceding train in the section.

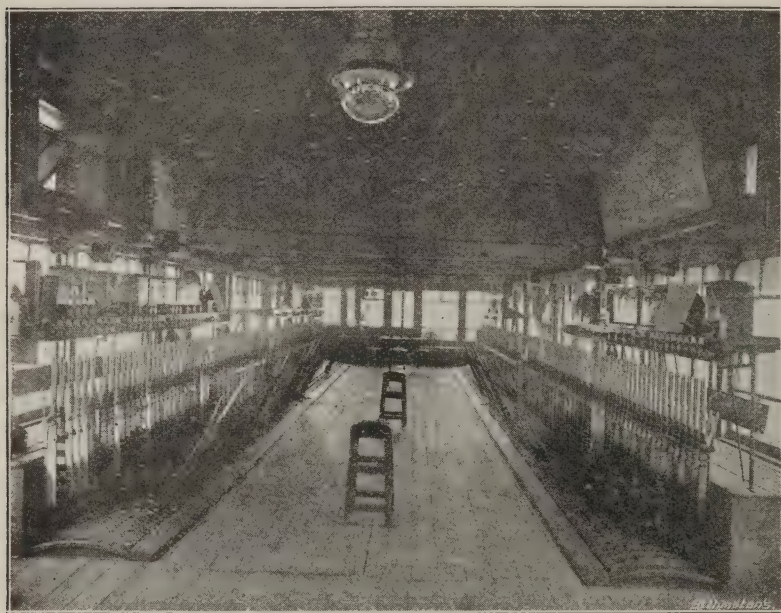
And here let me pause to ask my readers to consider for one moment what would be the result if we had to revert to such a state of things again? Probably three-fourths of the trains (goods and passenger) on some of our lines would have to be withdrawn; expresses entirely abolished; slow running universal; accidents of possibly daily occurrence; and chaos would reign in the railway world.

acoustic, and visual signals—that is, to indicate when the line between the boxes was "clear" of trains, and when it was "blocked."

This was undoubtedly an immense improvement, as it let the signalman know when to expect a train, and when to take his signals off for it to pass him, and to wire back to the rear when it had passed him intact. But alas for the fallibility of man! Make his task as simple and as light as you may, hedge him in with every precautionary instruction that you can devise, he is still *liable* to err. He could do wrong. Let me not be misunderstood, however. Considering the millions of trains per day that are safely signalled throughout the kingdom without mishap it is only due to the railway signalmen of this country to say

that this silent record alone is the highest compliment that can be paid to them. It is the sign and attestation of their care, their conscientiousness, and their judgment. It is, indeed, the certificate of an onerous duty well done.

Notwithstanding this, however, as it was possible to make a mistake a further advance became necessary, and it is the object of this article to show how, and to what extent, this is achieved on the suburban lines of the Great Eastern Railway.



INTERIOR OF "WEST" SIGNAL-BOX, LIVERPOOL STREET STATION,
GREAT EASTERN RAILWAY

To make myself clear I shall here, again, have to further preface my details by the general statement that every stop signal controlling the trains on the running lines from Liverpool Street to Chingford, and other suburban branches, is now normally locked at danger, and cannot be lowered by the signalman without he first asks permission (by ringing an electric bell) from the signalman at the signal-box in advance. And this permission the man in advance has not the power to give him unless the preceding train has passed him, and is well on its way to the box further in

advance. It is the *actual presence of the train* in this further section that, by electrical means, notifies to the signalman that it is clear of the rear section, and gives him the power to let another train enter it.

The apparatus, electrical and mechanical, by which this secure method of working is rendered possible is known as Sykes' system of electric interlocking and block.

Now, this apparatus is such that the electric block telegraph instruments (above referred to) in the signal-boxes and the outdoor signals

which control the running of the trains are so interlocked the one with the other that they can only be worked in unison. But the combination does more than this, as we shall see further on. The indoor electrical block and the outdoor mechanical signals not only control each other, but they control the signalman who operates them. And—still a step further—the engine and train itself, by means of an electrical in-

strument known as a rail contact, and which is operated by the depression of the rail as the train passes over it, also controls them all—signalmen, apparatus, and signals too.

As established upon the Great Eastern Railway (for through lines, sidings, junctions, and crossover roads), *in its most perfect form*, it is probably the most complete, the most reliable and secure method of controlling and expediting trains ever provided on any railway in the world.

And now, Mr. Editor, we will, with your permission, suppose that we have taken our

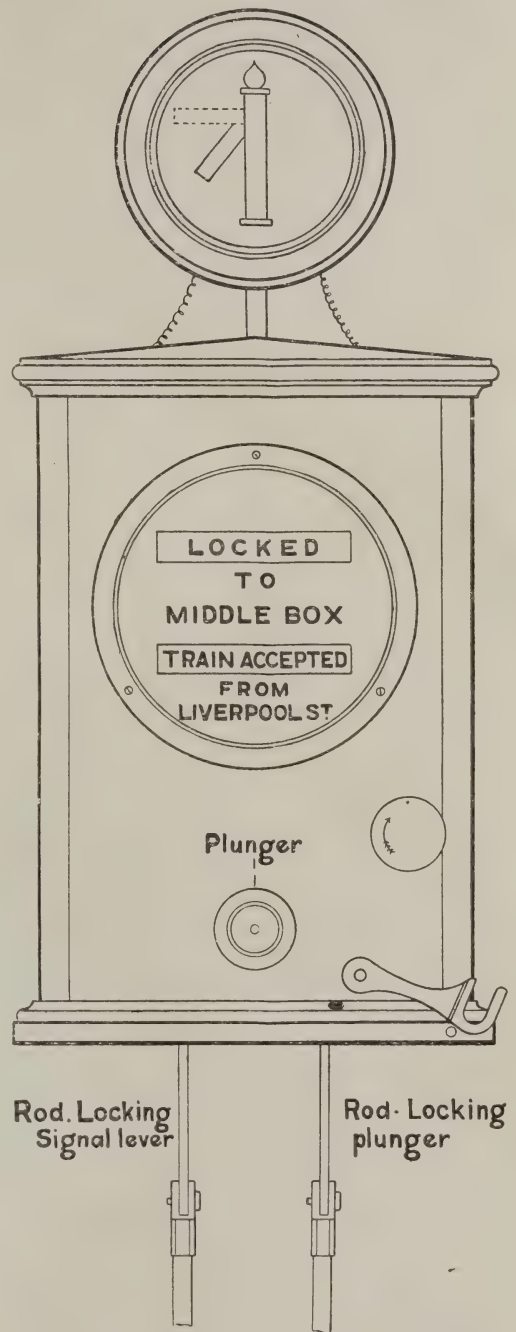
tickets and joined a train about to leave Liverpool Street Station for any one of the residential and suburban lines on the borders of Epping Forest.

Before our train can leave the platform line the starting signal for that line must first be lowered to the "all right" position by the signalman at Liverpool Street Station West Box.

But before he can lower this signal he must first ring up the Bishopsgate signalman, and ask, "Is line clear?" by four beats on the electric bell. If the *previous* train has passed Bishopsgate, and everything is clear and ready for the train, the signalman there immediately replies, not by the electric bell, but by plunging on the Sykes' electric locking instrument, which at once shows the indications as in the illustration at side on his own instrument.

The little miniature electric semaphore signal at the top being in the "off" or "all right" position indicates that the previous train has passed the next box in advance—known as the "Middle Box"—but the indication, "Locked to Middle Box," shows that the Bishopsgate starting signal for that section is *still* locked at danger. The lower slot or aperture, however, shows him "Train accepted from Liverpool Street." That is to say, the moment he plunged, in reply to the Liverpool Street signalman's inquiry, "Is line clear?" this "train accepted" disc fell in the front of the aperture to tell him, *and to remind him*, what he has done. The one plunge, however, on this instrument has also caused *the plunger itself* to be locked, so that it *cannot* be plunged again for another train until the train so accepted has arrived and gone forward. Now, this same plunge has also sent an electric current to a corresponding instrument in the Liverpool Street Station box, and the current has caused the disc of the electric locking instrument there, which is marked "Locked to Bishopsgate," to alter its indication to "Free to Bishopsgate." It has also taken the lock out of his (Liverpool Street) *advance* starting signal lever, and he may now lower the latter signal, *which he must do*—the

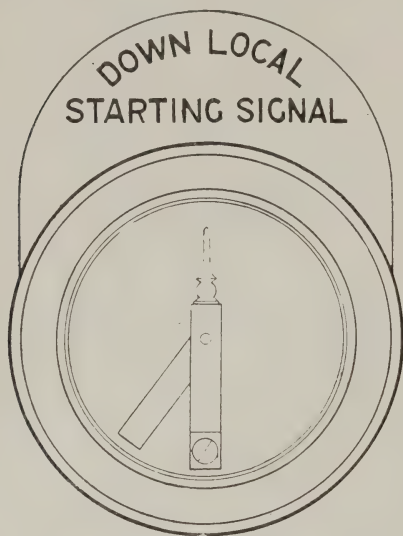
Electric Semaphore Block Indication



SYKES' ELECTRIC LOCKING INSTRUMENT

mechanical locking compels it—before he can lower the platform line starting signal.

Now, time being up (the operations described above have not taken fifteen



ELECTRIC REPEATER FOR SIGNALS

seconds), the starting signal is lowered, all converging point and signal levers that must be operated to divert the train to the required down line having been duly pulled over (or the signal could not be lowered), it follows that *all conflicting point and signal levers*, either for working in or out of the station, have been securely locked, as previously explained. The fact that the operation of the lever *has* lowered the signal is duly noted to the signalman by means of a little electrical instrument, known as an "electrical repeater for signals," placed exactly over the lever. Above is a drawing of it in the "off" position.

The instrument is electrically connected with a little contact on the signal arm itself, which is so constructed and connected that when the arm is pulled down it sends a current from an electric battery at the signal-post to the signal-box, which lowers the little electrical semaphore arm as shown. When the

signal is again put back it sends an electric current of opposite polarity, and the little semaphore arm again rises to danger and tells the man his lever has correctly done its work. If there was any failure it would stop in the middle position, and so indicate "out of order."

In the illustration of the Liverpool Street West Box, given on page 44, a number of these electrical repeaters may be seen just over the levers, and the position of every outdoor signal arm is repeated back to the signalman. There are seventy-two of them in this box alone!

But to resume. The starting signal and the advance starting signal both being off for us, we at once leave for Bishopsgate, and as we do so the Liverpool Street signalman gives the electric bell signal, "Train entering section" (two beats on the bell), to Bishopsgate. As we pass the advance starting signal at the entrance to the short tunnel we observe that not only is *it* in the "off" position, but that the lower signal with the forked end on the same post (which is the Bishopsgate distant signal) is also "off." It follows from this that Bishopsgate has now asked "Is line clear?" from the next (the Middle) box; that

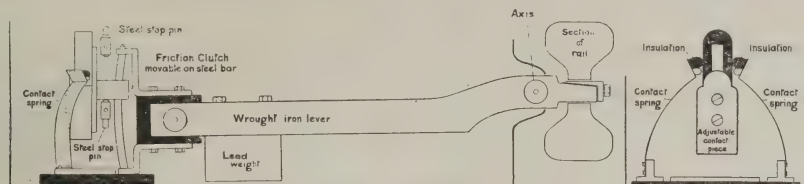


LIVERPOOL ST. DOWN LOCAL ADVANCE STARTING SIGNAL,
AND BISHOPSGATE DOWN LOCAL DISTANT SIGNAL

the latter has replied by plunging on his Sykes' electric locking instrument; that the indicator on Bishopsgate's instrument (shown

above) has now altered from "Locked to Middle Box" to "Free to Middle Box," and also, instead of "Train accepted," it now shows "Train on from Liverpool Street." His starting signal and his home signal therefore being unlocked he has lowered them,

a contact itself broken (almost unavoidable), and with over 500 of them in use—these rail contacts work month after month without a failure. Whenever there is a failure it is on the side of safety. It keeps the apparatus locked up. Millions of trains are signalled without a

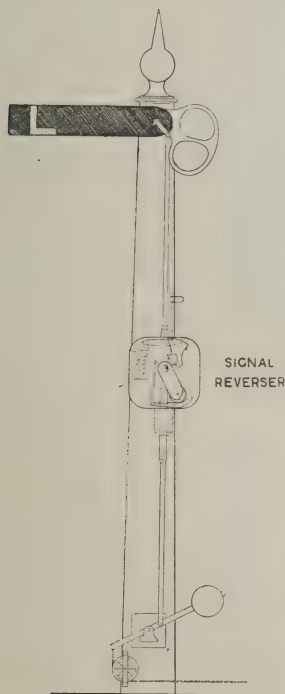


SYKES' ELECTRICAL RAIL CONTACT

and also his distant, that is, the bottom signal, at the entrance to the short tunnel from Liverpool Street, as indicated above. Immediately our train passes through this tunnel

single failure to any portion of the apparatus, which is doubtless as creditable to the workmen maintaining it as to the apparatus itself.

The depression of the rail (shown in section) by the weight of the train raises the lever, and thus makes an electrical contact at the free end. This instantly transmits an electric current from a battery alongside it to do three things. In the first place, it puts the Liverpool Street advance starting signal (which we have just noticed at the entrance to the tunnel) to danger behind the train, and thus *the train itself* has protected itself! The electrical reverser of the signal is shown as it is fixed.



"SYKES' BANJO"

and into Bishopsgate Station it passes over an electrical rail contact, already referred to and illustrated at the top of this page.

It will be interesting to note that—except through an odd broken underground wire or

It is familiarly known to the men who, so to speak, keep it in tune as "Sykes' banjo." And a very good banjo it is! Its music may not be classical, but it plays the popular railway tune, "Safety," to perfection. The moment this signal is automatically put to danger through the operation of the rail contact and signal reverser, as shown above, its changed position is instantly notified to both the signalmen at Bishopsgate and Liverpool Street by one of the little electrical repeaters before mentioned. The rail contact also transmits an electric current to the Bishopsgate box, and this takes the back lock off the lever of the home signal; and to the Liverpool Street box, where it takes the back lock off the lever of the advance starting signal, which latter, as explained, has already gone to danger *without* the lever being used. This

enables both the signalmen to now put back their respective signal levers (which they could not do before) ready for the next train. Immediately, however, they *are* put back they re-engage with the signal-arms, the levers are relocked, and the instruments reset, and *indicate* that all the apparatus is again locked up.

Long and laboured as the explanations given necessarily are, the operations themselves have been very simple. One minute before the train is due to start the electrical question, so to speak, is sent to Bishopsgate, "Is line clear?" In nine cases out of ten instantly comes back the reply, "Yes, and your signal is unlocked." Probably before he has taken his starting signal off for the train the further intimation comes by means of the electrical repeater, "My home signal is off for you." All in less than fifteen seconds! Long before the minute has expired all points and signals are right for the train, and promptly to time the bell rings, the barriers to the platform are closed, and the train steams out, and ninety-nine trains out of a hundred leave with the same promptitude.

All is done with that clock-work regularity and precision born of long experience and constant practice in dealing with heavy traffic,

and which is not only a credit to the machinery, electrical and mechanical, which renders it possible and *safe*, but to the railwaymen themselves, who so splendidly and intelligently manipulate it. As our train has now left Bishopsgate for Bethnal Green, and as between each and every signal-box the same kind of apparatus, with variations and additions, is in use for safely protecting and expediting it on its way, we may safely leave it without further recapitulating the operations that will continue to protect it to the end of its journey. Many and various are the devices combined with the apparatus already referred to for dealing with the complications necessarily arising at junctions, sidings, and crossover roads. One or two shall be given as typical of the rest.

We may have a train which, on approaching a signal-box, may not require to go into the section in advance, or it may be required to shunt into a siding to let a following train pass, and in this case it would not go over the sectional rail contact in the next block section, and by that means electrically release the apparatus to allow of the following train being accepted.

(To be continued.)



RUMBLINGS OF A RAILWAY REFORMER

By W. S. BEESTON, *Audit Office, G.N.R.*



WHAT dreadful troubles and disappointments people have in these days of advanced railway civilisation! No doubt the whole of our bald heads, wrinkles, want of whiskers, etc., are due to the distressing and heartrending troubles of the average train traveller. It had been known in our neighbourhood for weeks that I was about to have my annual holidays. My wife had carefully washed all my fine shirts at once, and these, with about twenty-two collars, made a remarkable show in our yard.

This was a kind of advertisement to the neighbours of what was about to happen. In addition, I borrowed several time-tables from our intimate friends, and feel sure the fact that I was about to proceed to Seaend for my holidays was well known.



But where was the enterprise of the railway? Did a porter arrive at my house to carry my bag? No. Was a special railway nurse sent to look after my children? No. Even my wife, who suffered from that distressing complaint, *idilitis*, had to walk to the station, the Company (I am sure this will hardly be credited) not even sending an invalid chair. And this in the age of improvement! What must it have been in the dark past? Well might Julius Cæsar invade Britain.

Trainology is certainly a study which would have puzzled the ancient philosophers. If I am late the train goes to time; if early, the train is sure to be late. And here comes another trouble. I trade with a grocer, and if I am in want of a few sheets of brown paper he courteously sends them in gratis, knowing,

good man, that he must oblige his customers. Does the railway act in a similar manner? Certainly not! During my stay at Seaend my expenditure with the Seaend Railway Company amounted to no less a gross total than 6s. 4½d. This was for visits to minor places of interest, which, I think, should have been included in the original fare—London to Seaend.

But no matter, the great trouble has yet to be told. After adding in this helpful manner to the dividends of the Company—becoming, in fact, an old and established ready-money customer—the stationmaster actually refused to hold the train for a few minutes to enable my wife to catch it!



This is barbarous and highly disgusting. The baby had been seized with a fit of coughing, and my wife had left the station to get soothing syrup from the nearest chemist.

Now this would not have detained the train more than ten minutes—at the most twenty (and many times I have known a train to be stopped for a mere signal much longer)—and for a regular customer the refusal seems a disgraceful piece of impertinence.

For ten tea tickets my wife can get a pair of fine art vases; for ten railway tickets—nothing! In fact, they do not like you keeping them at all. They evidently do not know the value of advertisement or proper economy. If they let passengers keep the tickets, railways could dispense with ticket collectors, and what a saving of wages that would be!

Epictetus of Phrygia was a perfect model of contentment, resignation, and benevolence, but I am sure he would have murmured

against such treatment, although he doubtless had a *special training*.

It may be that the railway companies have not the time to study the holiday question in all its various and far-reaching details; but, from investigation of the matter, I think that it is only reasonable that every tourist or excursion ticket should carry with it the following advantages and gifts:—A ready-made tourist suit, the loan of perambulators for children and bicycles for men, the use of the company's medical officer for trifling ailments, also trustworthy caretakers to be in charge of the houses of all holiday-makers, and these men should thoroughly understand rabbits, dogs, chickens, and gardening.

This would do more to popularise our railways than many of the so-called improvements, and the first company that, in addition to the above advantages, starts holiday-making on a scientific basis by giving away with each long-date excursion or tourist ticket a bottle of Condy's Fluid and a tin of Keating's Powder will reap a distinct benefit.

Of course I am fully aware of the great trouble that improvements on railways entail, and the tremendous difficulties encountered by the staff in getting passengers to take advantage of them. I will quote a case in point. I have a friend who, when receiving letters from his tradespeople (and, in fact, from many traders and patent medicine vendors who are total strangers), is always addressed as "Esquire"—"Thomas Jhones, Esq." It occurred to T. J. that the least the ticket collector could do was to touch his hat

to him when, on wet mornings, he condescended to leave the trams and honour the railway with his patronage. Jhones therefore wrote and placed the matter before the railway officials, and received a courteous reply acknowledging receipt of his letter and stating the matter would have attention. This was in January, 1896, but the ticket collector does not yet touch his hat to Jhones, Esq., although

it is almost 1899. This very clearly proves that, if it takes quite three years before a simple matter like this can be arranged by a great railway company, a terrible time must elapse before large improvements, such as those I have indicated, can be carried out.

A further trouble is the way in which railways object to let a passenger do as he wishes. In hot weather why should I be cooped up in a small compartment? If I desire to ride on the footboard of the carriage why may I not do so? If I desire to ride on the roof of the coach why may I not do so? I am fully insured. Are the railway bridges so insecure that I might knock them down if my body came into contact with them? If so, where is the County Council? Surely that interfering body can poke its nose into a matter of this kind?

Another fault is the very objectionable manner in which trains are started before the friends of passengers can fairly and squarely bid them farewell. My wife saw her mother off from Ustone a few weeks ago, and was only allowed to kiss the old lady seventeen times before the guard, in collusion with

the station inspector, started the train. Such brutality as this is inconceivable. A few weeks after another catastrophe occurred through this peculiar way of railwaymen in starting the trains before the passengers have signified that they are ready.

My wife has an old uncle, who is reported to be wealthy. Several weeks ago Uncle Jack came to town with a new scheme to place before Parliament. It was something to enable a man to do twelve hours' work in six. Well, my wife, in anticipation that he might do something for our son, did her very best to make him comfortable, and succeeded admirably. Uncle Jack took down



our little boy's name and age and many other particulars. This seemed very encouraging until the morning of departure.

My wife, self, and the heir apparent accompanied Uncle Jack to the station, and we all commenced taking a hearty farewell. But now comes the disgraceful and irritating circumstance



that deprived my boy of undoubtedly a large sum of money. Only six times had Tommy kissed his uncle when the train was started, and this in the face of the fact that Uncle Jack held a first-class ticket! No more difference made than if he had held a common third! No apology tendered! Preposterous!

My wife, being a determined woman, defied the men who could act in this wanton and debased manner, and fully made up her mind that Uncle Jack should have another parting kiss from his future heir. So, holding Tommy in her arms, she ran beside the train, uncle putting his head out of the window to meet the youngster's caress.

Then the accident occurred—trifling, you may say, but what about the expectations? Tommy by some means pulled off Uncle Jack's cap, and with it came his wig, disclosing his shiny head.



We have not heard from him since, and it is certainly no joke for an old man to travel three hundred miles

with a bandana round his head.

Thus was swept away my son's inheritance. I endeavoured to get my solicitor to sue the Company, estimating the damage at a clear £2,000, but he stated I had no chance of being successful, unless I could prove the train had been started before its advertised time. This I could have easily done if I had taken my bedroom clock to the station with me, as I found a week after that there was a clear

8 minutes 25 seconds difference in it and the station clock.

In conclusion, I may say that I am not a confirmed grumbler, and I think it was very uncivil of a railwayman who said, on my making a very slight allusion to some trifling matter and pointing out that I was a season ticket holder, "Yes, sir, we allow so much grumbling with our season ticket holders—it all comes in the contract." An actuarial friend explained this retort by the following table:—

	£	s.	d.
Fare for three months	3	8	9.0082
Cost of forms concerning same ...			.3107
Cost of cardboard for ticket ...			.4329
Cost of carriage of ticket to suburban station ...			.1287
Terminals ...			.2604
Office and establishment expenses ...			2.0001
Estimated postage re complaints from holder of ticket ...	1	2	5.000
Cost of stationery re above ...			3.0007
Proportion carried to contingency fund ...			1.0289
Proportion carried to accident fund ...			2.0013
* "Loading" ...			3.2074
	3	10	11.8993

Cost of season ticket ... £3 10 11½

* This does not refer to the expense of porters putting passengers into the carriages; the actuary says it is a technical term.

Such a retort as the above upon the part of a mere railwayman, I consider, was distinctly rude; but I have found as a rule that the words, "I am a season ticket

holder," said in the proper dignified manner, work wonders, and, if the "season" is drawn from the pocket and gracefully flourished under the nose of the minor officials, it instantly causes the deepest respect. But before trying the flourish be sure that you have the ticket with you, as it once cost Jhones 1s. 9d. excess. The ticket had been left at home.



THE GLASGOW CABLE RAILWAY

By W. H. HAWLEY

Illustrated from Photographs by ALEX. SIMPSON, JUN., M.I.C.E.

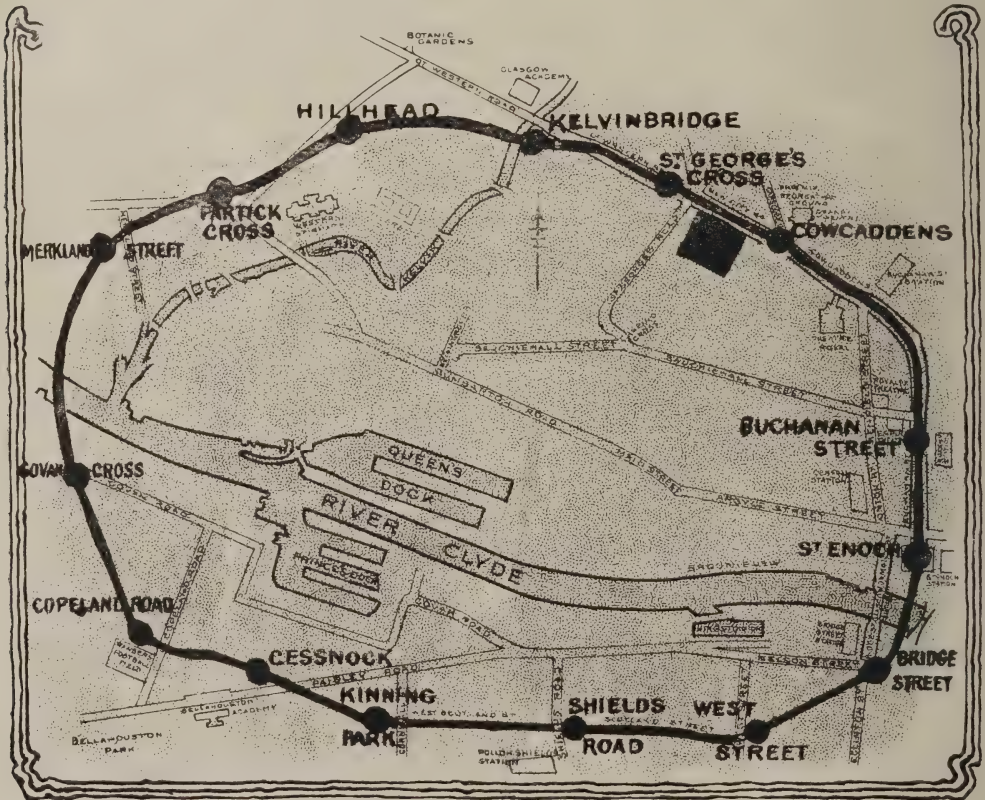


THE rapid strides made by the principal railways during the last few years in their endeavours to afford the British public improved facilities for fast, comfortable, and, above all, safe

for the requirements of the vast populations of our great cities.

The Glasgow District Subway Company stands very prominent in this direction, and takes credit for first utilising the cable system as the motive power for a full fledged railway.

As is usual in railway construction, great



MAP OF THE GLASGOW DISTRICT SUBWAY COMPANY (GLASGOW CABLE RAILWAY)

means of transit, tend to make one overlook the fact that there are also smaller corporations which are not behindhand in providing

or small, a considerable amount of time and money was expended in obtaining Parliamentary authority for the construction of the line ;

so that, although a Bill was promoted in 1887, it was not until 1890, after determined opposition, that powers were granted to construct an underground cable railway in Glasgow.

In the spring of 1891 that well-known engineer, Mr. Alexander Simpson, of the firm of Simpson and Wilson, Glasgow, commenced his momentous task.

bed ; on one occasion the whole of the timbering was blown up into the river and floated away, making a large hole about 20ft. across. These repeated mishaps so disheartened the contractor that he retired from the undertaking, saying it was impossible to carry out the project on the proposed lines. However, Mr. Simpson thought otherwise, and induced Mr. G. Talbot to take up the work, and by care-



EXTERIOR OF ST. ENOCH STATION, GLASGOW CABLE RAILWAY

As will be seen by the map, the line passes under the River Clyde twice—at Govan and St. Enoch. Space will not permit me to dwell upon the many difficulties Mr. Simpson had to overcome, but in passing I will mention the fact that in making the tunnels under the Clyde at St. Enoch the bed of the river was blown up a number of times, the receding tide allowing the air pressure—which is an important principle in the system of tunnelling adopted in the construction of the railway—to overbalance the pressure caused by the weight of water and matter in the river

fully regulating the air pressure to the state of the tide he completed it without further mishap.

Each line of rails—the up and the down—has its separate tunnel; they are connected by man-holes at intervals of 25 yards.

The railway is $6\frac{1}{2}$ miles in circumference, the stations are 15 in number, and at each of these the two tunnels are merged into an opening 150ft. long by 28ft. wide and about 16ft. high. The platform at each station is of the “island” type, and is 26in. high, 10ft. wide, and runs the whole length of the station.

At the end of the platform nearest the street is the staircase, by which the passengers enter and leave the station. Six of the stations—namely, Govan, Shields Road, Buchanan Street, Cowcaddens, St. George's Cross, and Kelvin Bridge—are entirely underground, necessitating artificial lighting during working hours. All the other stations have the benefit

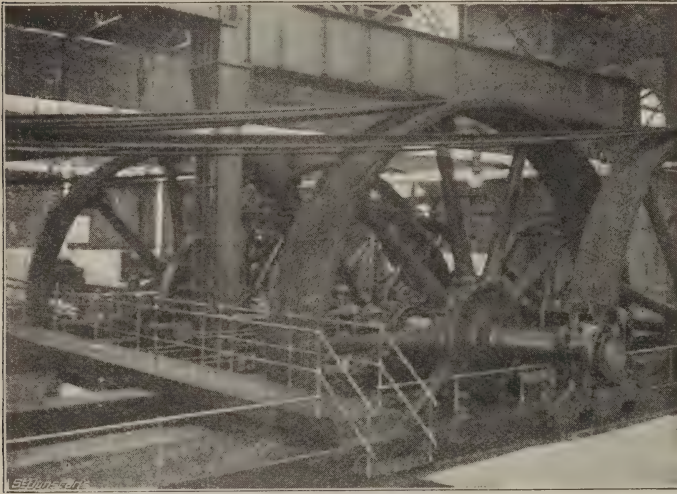
signals, one for each direction, showing red and green lights; these are worked in conjunction with the block instrument, which is suspended from the roof in the centre of the platform, the instrument being worked electrically by the passing trains. Electric bells are provided to sound when the instrument is worked, small semaphore arms showing "line

clear" or "line blocked," as the case may be. The following is the method of working:—A train being ready to start (the previous train having already left the station in advance, the block instrument in consequence showing "line clear"), the controller is set, and the starting signal can be lowered. As soon as the train has passed its own length in advance of the starting signal it passes over an electrically connected treadle, which puts the block instrument to "line blocked" and the semaphore starting signal to "danger," in which

position it is locked until again released. When the same train has passed its own length at the next station in advance, it acts upon another treadle, which puts the block instrument to "line clear" at the station behind, thereby releasing the starting signal for another train to follow. There is also telephonic communication from station to station, so that in the event of a breakdown of the signal system the traffic can be carried on with perfect safety.

The outward appearance of the stations varies to a great extent. St. Enoch is certainly a most handsome structure, and is built of red sandstone, from the designs of Mr. James Miller, I.A.

Although the line is worked on the absolute block principle, no signalmen are employed, Messrs. Saxby and Farmer's patent semi-automatic system being in use. Each station is provided with two semaphore starting



INTERIOR OF ENGINE ROOM, GLASGOW CABLE RAILWAY

of daylight. The whole of the stations, corridors, offices, and the cars themselves are lighted by electric light, the current being generated at the power station.

The most minute details have been carefully thought out by the engineers. As an instance, I may mention that each of the stations is situated at the summit of a slight elevation, the line having a gradient of 1 in 40 from the centre of the length of the station, so that when a car enters a station it does so on a rising gradient, and, stopping just on the summit, leaves on a falling gradient. This not only reduces the strain on the cable, but greatly facilitates a smooth start.

Although the line is worked on the absolute block principle, no signalmen are employed, Messrs. Saxby and Farmer's patent semi-automatic system being in use. Each station is provided with two semaphore starting

Before proceeding to describe the cars I will endeavour to give my readers some idea of the extensive plant necessary to generate the power by which the cables are worked. Not

many of the thousands who pay their pence at the turnstiles have the slightest conception of the massive machinery housed at the power station.

The power station is situated between the West Street and Shields Road stations. The whole of it is of an extensive and substantial character, and it is divided into three sections—viz., engine-house, boiler-house, and “tension run.” The engine-house is 138ft. long by 100ft. wide; the main engines—there are two—are of the horizontal, single-cylinder, non-condensing type, and are the most powerful single engines used for this class of work in the world. The cylinder is 42in. in diameter, with a stroke of 6ft., the piston rod and connecting rod measuring 16ft. in length. The enormous fly-wheel is 25ft. in diameter, and weighs 50 tons. Each engine is capable of developing 1,500 horse-power. Midway between the two large engines is a vertical double-cylinder engine, the cylinders of which are 14in. in diameter and 18in. stroke, which acts as a barring engine to assist in starting its two big brothers. Across the house runs the main driving shaft; it is made in two lengths, and varies in diameter from 18in. to 21in., with all the couplings and bearings arranged so that the shafting may be run by either or both engines. On each section of this shaft is a 26-grooved rope drum, 13ft. 9in. in diameter; these drums each drive two 25ft. rope drums, each of which is mounted on separate shafts, one being 18ft. in advance of the other; of the 26 driving ropes 15 drive the first drum, while owing to the method of wrapping the cable round its driving drums the second rope drum does not do so much work as the first drum, and therefore only takes 11 ropes. On the overhung ends of each of the 25ft. drum shafts there is a

14ft. cable drum, and it is *these* two drums which *together* drive *one* of the cables. Under ordinary circumstances only one engine is working at the time, it being abundantly powerful to haul all the traffic that could possibly be carried on both lines. The western half of the plant drives the inner circle cable, and the eastern half the outer cable.

A very important part is played by the simple-looking gear in the “tension run.” It will at once be seen that, whereas it is possible for all the cars to be “on” the cable at one time, it may happen that half of them are standing at the stations, and therefore the strain on the cable varies to a very great extent; it is to prevent any slackness and to ensure the steady running of the cars that the tension regulator is used. The regulator consists of a number of weights slung by four



TENSION APPARATUS IN POWER STATION OF THE GLASGOW DISTRICT SUBWAY COMPANY

long links; two of these links are attached to the anchorage at the end of the run, the other two being attached to a movable trolley on which is mounted the tension carriage, so that when extra strain (caused by stationary cars gripping the cable) is put on the cable the tension carriage moves from the anchorage end of the run, thereby raising the weights, and when the strain is reduced the weights

sink, and in so doing draw the tension carriage towards the anchorage, and so maintains a uniform tautness of cable.

The boiler-house, a building 138ft. by 88ft., contains eight Lancashire boilers 8ft. in

height of the car floor is only 26in. from the top of the rail, exactly level with the station platforms. The seats run longitudinally, and are made up of alternate strips of birch and mahogany; they give accommodation to 42

passengers, allowing 18in. for each person. The seat on each side of the car is divided into three portions by partitions projecting to the edge of the seats, with seating room for three persons between the partitions. Besides supporting the roof these partitions, which are fitted with handsome stained-glass panels, greatly improve the appearance of the interior. The doors, ends, and partitions are of polished teak, with oak panels and white ash mouldings. The roof panels are of zinc, painted a

pleasing cream colour, and are lined with gold and vermillion. The cars are illuminated by four 16 candle-power incandescent electric lamps, the necessary current being gathered from two conductors running continuously on the inner side of the tunnels by means of skids attached to the side of

diameter and 30ft. long; five of these are constantly under steam, the other three being in reserve. The boilers are fitted with Vicar's patent mechanical stokers, and the coal is brought from the coal store and distributed to the various hoppers by means of an elevator and screw conveyers.

The cables are each 36,300 feet long and 1½in. in diameter; they are drawn from patent crucible steel, and are made up of six strands of from 13 to 16 wires per strand—in all about 600 miles of steel wire, weighing 57 tons. The "life" of these cables varies to a great extent.

The passenger cars are of the bogie type, with vestibules at each end, and were built by the Oldbury Carriage and Wagon Company. The extreme length is 40ft. 9in., the body being 32ft. and the vestibules 4ft. 4½in., while the width is 7ft. 6in. The under-frames are of steel. The wheels are 27in. in diameter, and come partly through the floor, as the

the cars; the conductors are connected by what is known as the three-wire system. The cars are also fitted with electric bells for signal purposes between the driver and conductor. The outside of the cars is painted and varnished, the bottom part plum colour, and the top part cream. The passengers enter



INTERIOR OF COPELAND ROAD STATION, GLASGOW DISTRICT SUBWAY COMPANY



EXTERIOR OF CARRIAGE, GLASGOW CABLE RAILWAY



INTERIOR OF CARRIAGE, GLASGOW CABLE RAILWAY

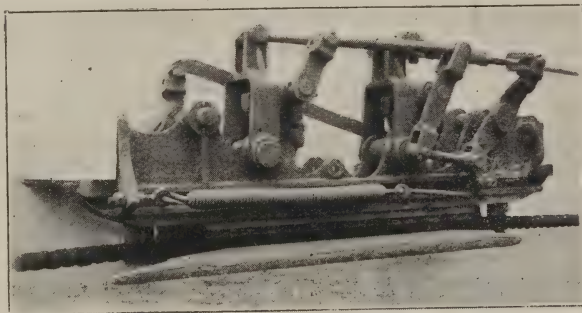
the cars by the rear vestibule only, the front being the way out; this plan works wonderfully well, and very little time is occupied at stations. Both vestibules are guarded by Bostwick's collapsible gates, while sliding doors are used to shut off the vestibules from the interior of the car.

In addition to very powerful hand-brakes, which in the ordinary course are sufficient to stop the cars, they are also fitted with the Westinghouse automatic brake, the compressors are at the power station, and the compressed air is "on tap" at West Street Station by means of the usual flexible hose couplings.

The most important part of the fittings is the gripper, by means of which the motion of the cable is imparted to the car. The gripper is fixed behind the forward axle of the leading bogie, and takes the form of a powerful vice. The top jaws are 3ft. long, and the bottom 3ft. 6in., both being fitted with steel dies shaped to fit the cable; the bottom

jaw is fixed, so that when the car is stationary the cable runs through the die; the top jaw is lowered or raised by means of levers at the will of the driver. The cable is an endless one, and therefore it is necessary for the car, in completing the circle, to "slip" the cable just previous to its entering the power station to pass round the driving drums, and the car, running a few yards by its own momentum, again "picks" up the cable as it leaves the power station. This cable

"slipping" is brought about by the "trip gear," as it is called, specially designed for this purpose by Mr. D. H. Morton, A.M.I.C.E., M.I.M.E., the consulting mechanical engineer of the line. It consists of a complicated-looking arrangement of springs, links, and levers operated by means of a hand lever by the driver. Should, however, the driver fail to use the lever at the right moment the same effect is automatically brought about by means of a small roller on the forward end of the gripper coming into contact with a long clam-bar fixed between the



THE "GRIPPER," THE APPARATUS EMPLOYED TO GRIP THE CABLE, GLASGOW CABLE RAILWAY

rails. To thoroughly test this ingenious piece of mechanism Mr. Morton himself took a car over the cross-over road when the gripper had fast hold of the cable.

One of the many difficulties to be overcome by the engineers in planning this unique underground line was arranging for the cars to be placed on and removed from the running

repairs to stock and plant are executed on the premises by the Company's own men.

The line was first opened on December 14th, 1896, when the universal charge of one penny for any distance was made; so great, however, was the rush that it became impossible to work the cars, and the line had to be closed until a more satisfactory method of



PASSENGERS ON OPENING DAY WAITING THEIR TURNS TO PASS THROUGH THE TURNSTILE AT ST. ENOCH STATION OF THE GLASGOW DISTRICT SUBWAY COMPANY

lines as quickly as possible, sidings, of course, being out of the question. It was finally decided to build the car sheds immediately over the tunnels, so that, by means of a travelling crane placed immediately over the large opening known as the car pit (55ft. long by 28ft. wide), the cars could be lifted bodily to the surface, a distance of 20ft. This crane also carried the cars to whatever part of the shed they were required. The car shed is a building 220ft. long by 115ft. wide, and affords ample space for stabling all the cars at night. Those not running are cleaned and repaired in this shed during the day. All the

dealing with the vast number of passengers it was evident would patronise the undertaking had been devised. The illustration on this page shows the crowd of passengers waiting to obtain tickets. On January 21st, 1897, the line was reopened; this time penny and twopenny tickets were issued. A penny ticket entitles a passenger to travel to the fourth station from his starting point, while the twopenny tickets are available for the whole round, the tickets being collected as the passengers leave the cars. This arrangement is found to work very satisfactorily.

The cars travel at a uniform rate of 12

miles an hour, and a three minutes' service is maintained between 7.30 a.m. and 11.30 p.m.

The Company have now 60 cars—30 “grippers” and 30 “trailing.” Twenty of each are constantly running, the others being in the car-sheds for cleaning purposes. The trains are made up of two cars, the grip-car being for non-smokers, and the trailing-car for smokers, affording equal accommodation.

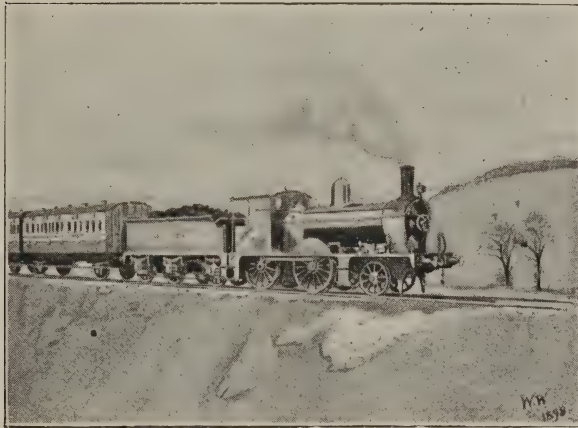
The staff is worked on the “double shift” system, each turn working $8\frac{1}{2}$ hours, while excellent arrangements are made for the relief of any servant when necessary. The service is therefore very popular, and the manager is able to pick and thoroughly train his men.

The Glasgow District Subway Company is meeting with the success it deserves. During the half-year ending July 31st, 1898, no less than 5,779,119 passengers were carried; in

money this meant £27,882 7s. 10d. As the train mileage was 543,114, this works out at 12.33d. per train mile, while the total cost per train mile was 7.18d. For the sake of comparison I will give the number of passengers carried during the same period by the City and South London Railway (Electric) and the Liverpool Overhead Railway (Electric):

Glasgow District Subway	... 5,779,119
Liverpool Overhead	... 4,472,941
City and South London	... 3,478,977
(Exclusive of 526 season-ticket holders.)	

My best thanks are due to Mr. James Gibson Brown, the General Manager, and to Mr. William Dick Maclean, the Superintendent Engineer, for their kindness in explaining the working of the line, plant, etc., and also for supplying the information concerning the same.



TO THE SUNNY SOUTH BY RAILWAY

BY "COSMOPOLITAN"



THE number of favoured mortals who shake themselves free from the fogs and mists of this dismal island and winter in the sunny South increases year by year. From December to March the exodus is

in full progress, and at the end of March the return of the wanderers commences. Some go to Algiers, some to Cairo, some to the Canaries; but the bulk make for that sunlit strip of shore which lies between Marseilles and Genoa, and is known to Englishmen as the Riviera.

A short account of the various special arrangements made at this season of the year for the conveyance of these birds of passage, together with an analysis of the rapidity with which they are enabled to reach their respective destinations, may not be without interest; and what measure of progress or otherwise has distinguished the various services to the Riviera in the present year of grace will be duly noted. I do not propose to discuss in detail the vexed question of fares and sleeping-car supplements. They are both exorbitantly high, and therefore debar hundreds from the benefits of wintering on the Mediterranean. A first-class return ticket from London to Nice (with sleeping-car fee added) costs £22 16s. The distance is $955\frac{1}{2}$ miles. From London to Wick the distance is 755 miles, and the return fare (first-class with cost of sleeping-car ticket added) is £9 16s. Comment is superfluous.

The various through services to the Riviera

may be conveniently considered in the following order:—

- (1) From London, viâ Calais.
- (2) From London, viâ Boulogne.
- (3) From Amsterdam, viâ Paris.
- (4) From Paris, viâ Marseilles.
- (5) From Vienna, viâ Venice.
- (6) From St. Petersburg, viâ Vienna.
- (7) From Bâle, viâ Geneva and Marseilles.

The Riviera itself is divided into two portions: the French Riviera, which extends from Marseilles to Vintimille (the Italian frontier station), and the Italian Riviera, which stretches from Vintimille to Genoa. The route to both sections is viâ the P.-L.-M. Company's line, though in the case of the Italian Riviera the traffic is handed over to the Mediterranean Company of Italy at Modane. There are, however, no through trains to stations east of Vintimille, with the exception of the Vienna-Nice express, consequently the service to that section will not be considered, except in so far as it is performed by this train.

A brief description of the various special carriages used for the conveyance of traffic may not be out of place.

First and foremost there is the ordinary sleeping-car. I take it that all my readers are familiar with this type of vehicle. The cars are divided into two and four berthed compartments opening on to a side corridor. Lavatories are provided at each end of the corridor, and, on the newer cars, in some of the compartments as well. The cars are warmed, but are very badly lighted and ventilated. The following brief description is official: "Sleeping-cars are constructed on the bogie principle, and have eight wheels. They weigh on an average 25 tons, the whole of the framework

being constructed of iron and steel. They are absolutely untelescopable in case of collision. The cars usually contain from 16 to 18 places."

The "lits-salon" type of carriage is something after the same model. These vehicles

contains three "fauteuils-lits," but seldom provides lavatory accommodation, and the same rule as regards reservation of places in advance holds good as in the case of the "lits-salon." "Fauteuils-lits" carriages are rather smaller and less comfortable than are those of the "lits-salon" class, and the supplement charged for the privilege of travelling in them is lower. They represent an altogether older type of vehicle. "Coupé-intérieur" and "coupé-toilette" carriages are merely, in the first case, ordinary first-class compartments with lavatory accommodation, and, in the second, simple corridor carriages with one general lavatory. It seems strange that a high extra fare should be charged for travelling in vehicles of the latter description. We have come to demand coaches of this description as a positive right in England. It



THE RIVIERA DAILY EXPRESS "TRAIN DE LUXE," MARSEILLES TO MENTONE. SALOON AND RESTAURANT CARS ONLY

are divided into separate compartments, each containing three ordinary seats by day. The seats are capable of being extended to form a bed by night, so that the compartment then contains three narrow parallel sofas. A lavatory is usually placed between each pair of compartments. The fare, though less than that charged in sleeping-cars, is very high to English notions, and it is, moreover, not possible to reserve single places in advance: the whole compartment must be engaged. As these "lits-salon" carriages are invariably only six-wheeled stock they run anything but smoothly over the badly-laid French permanent way.

A "fauteuils-lits" carriage is essentially of the same design as a "lits-salon" vehicle. The difference consists in the way in which the compartments are converted into sleeping-rooms at night. In the case of a "fauteuil-lit" this is effected by lowering a square board, which, when in position, just meets the ordinary seat, thus forming a kind of couch. Each compartment

need hardly be said that all the carriages mentioned above are first class only. No express trains in France convey second-class passengers unless those despised individuals purpose travelling for a very long distance, while the third-class passenger who proposed travelling from Paris to the Riviera would be in the sere and yellow leaf by the time he arrived at Vintimille, supposing him to be a sprightly young man when he boarded the train at Paris.

And now to turn to the trains themselves. The service to the Riviera is wholly inadequate. The trains are fearfully overcrowded, and double the number which are now employed to convey the traffic could be run at a profit and comfortably filled. By far the greater proportion of passengers to the South of France come from England, and nearly all the important trains to the Mediterranean littoral are arranged in correspondence with the Dover mail-packet services.

The first and perhaps most important train to the South of France is therefore the

"Calais-Méditerranée" express. This train is composed exclusively of sleeping and dining cars, and runs from Calais to Paris (Nord), and thence, *viâ* the outer girdle railway, round Paris to the P.-L.-M. Company's line, not calling at the Gare de Lyon in Paris. The speed as far as Marseilles is fair, but the train is very light. It should be noted that after Marseilles the stops are too frequent to enable anything approaching a high rate of speed to be attained. Moreover, the coast-line teems with sharp curves and severe gradients, in themselves a barrier to fast running.

Calais (dep.)	12.49 p.m.
Paris (Nord, arr.)	4.35 p.m.
Paris (Nord, dep.)	4.50 p.m.
Vintimille (arr.)	10.23 a.m.

Distance, 888½ miles. Speed, 41 m.p.h.

This train runs three times a week from Calais as the "Calais-Méditerranée" express, and three times a week from Paris (Nord) as the "Paris-Méditerranée" express. As the "Paris-Méditerranée" express it leaves the Gare du Nord at 4.13 p.m., and the Gare de Lyon at 5.30 p.m., falling into the above timing at Laroche.

The next service is performed by the Calais-Mentone express. This train leaves Calais at 3 p.m., and follows the same route to Mentone as does the Calais-Méditerranée express. The through carriages for the South are run, *viâ* the girdle railway, to the P.-L.-M. station, and there attached to the 8.45 p.m. "rapide." The timing is as follows:—

Calais (dep.)	3. 0 p.m.
Paris (Nord, arr.)	7. 0 p.m.
Paris (Nord, dep.)	7.44 p.m.
Paris (Lyon, arr.)	8.24 p.m.
Paris (Lyon, dep.)	8.45 p.m.
Mentone (arr.)	3.40 p.m.

Distance, 881½ miles. Speed, 35.7 m.p.h.

This resultant speed hardly seems commensurate with the high fares charged.

The Boulogne-Riviera service is effected by means of through carriages from Boulogne (Quai) to Mentone. They also are attached to the 8.45 p.m. train from Paris. The through coaches leave Boulogne (Quai) at 2.13 p.m., and reach Paris (Nord) at 5.40 p.m. This cannot be described as being a very expeditious service, inasmuch as it is possible to leave the Gare du Nord at 6.18 p.m. and arrive at the Gare de Lyon at 7.9 p.m. in ample time to catch the 8.25 p.m. "rapide," and thus avoid the wait of two hours at the Gare du Nord, whereas the timing of the through coaches is as follows:—

Boulogne (dep.)	2.13 p.m.
Paris (Nord, arr.)	5.40 p.m.
Paris (Nord, dep.)	7.44 p.m.
Paris (Lyon, arr.)	8.24 p.m.
Paris (Lyon, dep.)	8.45 p.m.
Mentone (arr.)	3.40 p.m.

Distance, 860½ miles. Speed, 32.2 m.p.h.

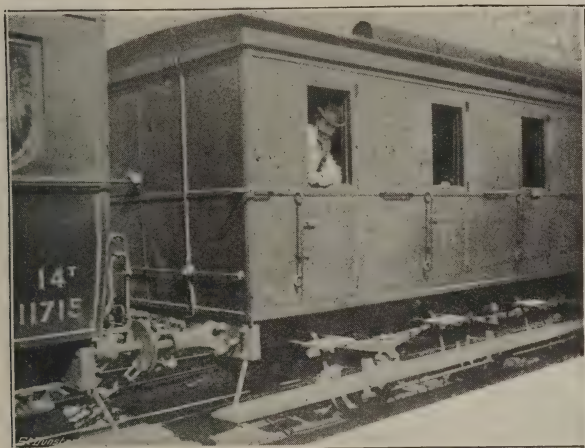


TYPE OF P.L. & M.R. LOCOMOTIVE EMPLOYED TO HAUL TRAINS TO THE "SUNNY SOUTH"

The through service from Amsterdam is newly instituted; "fauteuils-lits" and ordinary carriages run from that city to Vintimille. The route which they follow is an interesting one, and, though this service has scarcely got beyond the experimental stage, there may be a future before it, inasmuch as the Great Eastern Railway Company could easily arrange to connect with the through train *viâ* the Hook of Holland, and thus afford a new route

to the Riviera. These carriages possess the advantage of being worked on very fast expresses, a state of things which does not fall to the lot of all "voitures directes," as many

nightly clamoured for better accommodation than was afforded by running the 8.25 in two divisions, the second portion usually consisting of old and dirty rolling stock, and being without a sleeping-car.



A THIRD-CLASS CARRIAGE ON 11 A.M. EXPRESS!
PARIS TO VINTIMILLE

a weary traveller can testify. The following is the schedule:—

Amsterdam (dep.)	7.12 a.m.
Paris (Nord, arr.)	6. 0 p.m.
Paris (Nord, dep.)	6.18 p.m.
Paris (Lyon, arr.)	7. 9 p.m.
Paris (Lyon, dep.)	8.25 p.m.
Vintimille (arr.)	3.34 p.m.

Distance, 1,017½ miles. Speed, 31.7 m.p.h.

This through service meets with a very fair measure of patronage.

In turning to the Paris-Riviera services we find that we have already considered three of the most important express trains performing this journey, *i.e.*, the "Paris-Méditerranée" and the two "rapides" (the 8.25 and 8.45 p.m. trains). The 8.25 p.m. was formerly the "Flying Dutchman" of France. It was the only quick train to the South, and the only one on which sleeping-cars were run. Every night hundreds of people thronged the platform two hours before the booked time of departure, and duplication was frequently necessary. In 1895 this train was accelerated by one hour. The 8.45 p.m. "rapide" was put on as a tardy and grudging concession to the comfort of the crowds who

booking have a good deal to do with this state of things, and the supplementary fare (£2 18s. 6d.) is far too high in proportion to the extra comfort afforded by the sleeping berths. These vehicles provide little more in the way of accommodation than is to be obtained by lying at full length on the seat of an ordinary carriage, and it is only the disgracefully overcrowded condition of all trains to the South that compels people to travel in these special coaches, because the rest of the train is usually quite full. Another inconvenience attached to travelling by the "Nice Express" is to be found in the fact that no stop is made for meals anywhere *en route*, and, as there is no dining-car, this constitutes a very serious drawback.

Paris (Lyon, dep.)	7.25 p.m.
Nice (arr.)	11.45 a.m.

Distance, 675¾ miles. Speed, 42.2 m.p.h.

The train actually runs through to Mentone, but, as the stops are very numerous after Nice, the speed has only been calculated to that point, so that the performance may appear in the best possible light. However, not even adventitious aid can place this costly "train

de luxe" in the same high category as that in which our own third-class Scotch expresses are established.

One more first-class train remains to be considered before we turn to view the accommodation provided for those travellers despised by all French railway companies—the second and third class passengers. This is the 9.25 a.m. "rapide" to Marseilles, with through carriages for Mentone attached. The morning "rapide" suffers from the same objectionable overcrowding as do the two night expresses, for the morning train is invariably doubled, and those travelling in the second portion thereof practically starve. These unfortunates arrive at the Gare de Lyon under the impression that a dining-car will travel with their train, and that it is therefore unnecessary to bring food with them. They fail to obtain seats in the first portion of the express, with which the "wagon-restaurant" runs, and are obliged to content themselves with raids on refreshment counters (stocked with famine-priced provisions) during the very brief and infrequent stoppages which the train makes. Even for those who travel in the first portion there remains the discomfort of the "troisième déjeuner"—*i.e.*, passengers seated in the rear carriages can only breakfast or dine after the more favoured mortals in the coaches nearer the restaurant-car have been served. This virtually means that they are reduced to the necessity of bolting their meals in some twenty minutes, for the dining-cars do not work with the train throughout its entire journey, but are detached at certain places, while others are again picked up further on.

The timing of the morning "rapide" is as follows:—

Paris (Lyon, dep.)	9.25 a.m.
Marseilles (St. Charles, arr.)	10.25 p.m.
Marseilles (St. Charles, dep.)	12.20 midnight.
Vintimille (arr.)	8.6 a.m.

Distance, 697½ miles. Speed, 30.3 m.p.h.

The train waits two hours in Marseilles.

And now for those unfortunates, the second and third class passengers.

Second-class passengers can travel by one so-called express; but the name is a gross misnomer, inasmuch as the speed of the train in question works out to considerably less than thirty miles an hour.

Paris (dep.)	2.0 p.m.
Vintimille (arr.)	11.0 a.m.
Distance, 697½ miles. Speed, 27 m.p.h.	

This train is highly inconvenient for passengers from England. They must either leave London by the 9 p.m. night service (an obvious impossibility in the case of invalids), or, as an alternative, they might spend one night in Paris.

Third-class passengers have the choice of three trains, and a veritable "Hobson's choice" it is. The figures speak for themselves:—

(1)

Paris (Lyon, dep.)	11.15 a.m.
Mentone (arr.)	1.24 p.m.
Distance, 690½ miles. Speed, 24.8 m.p.h.	



TO THE "SUNNY SOUTH"—A GLIMPSE OF THE
"GOLDEN MOUNTAINS" NEAR DIJON

(2)

Paris (Lyon, dep.)	4.10 p.m.
Vintimille (arr.)	11.38 p.m.
Distance, 690½ miles. Speed, 21.01 m.p.h.	

(3)

Paris (dep.)	10.40 p.m.
Nice (arr.)	11.40 p.m.
Distance, 675½ miles. Speed, 26.8 m.p.h.	

The full analysis of the trains from Paris to Vintimille is therefore as follows:—

No.	Class.	Average Time.	Average Speed.
5	1st	19.2 hours	36.6 m.p.h.
3	2nd	25.0 hours	27.7 m.p.h.
3	3rd	27.0 hours	25.7 m.p.h.

In 1896 a new and very useful service was inaugurated between Vienna and Cannes. A "train de luxe," similar in equipment to the "Calais-Méditerranée" express, now runs daily in each direction between the two points named. As this express serves the whole of Northern Italy it is extensively patronised for local as well as for through journeys. It is the only train running between the French and Italian Rivas.

Vienna (Sudbahnhof, dep.)	11.25 a.m.
Venice (arr.)	1.20 a.m.
Venice (dep.)	1.30 a.m.
Milan (arr.)	6.22 a.m.
Milan (dep.)	6.32 a.m.
Genoa (arr.)	9.21 a.m.
Genoa (dep.)	9.30 a.m.
Vintimille (arr., C. European time)	1.20 p.m.
Vintimille (dep., French time)	12.40 noon.
Cannes (arr.)	2.19 p.m.

(Central European time is 56min. in advance of French time.)

Distance, 655 miles. Speed, 24.25 m.p.h.

The year 1897 witnessed a still further development of the ever-growing traffic to the Sunny South. Through carriages had hitherto run from Holland, Germany, Italy, Austria, and Switzerland to that favoured sea-coast, and now Russia has been added to the list of countries whose inhabitants are so eager to fly from winter and its attendant ills that the various companies concerned have felt justified in affording them a fast through service. Twice weekly a section of the new "Nord" express (which until November, 1896, ran only to Calais, Ostend, and Paris) continued on to Vintimille in 1897, and was attached to the Paris-Méditerranée express at Paris (Nord). Germany and Belgium benefited by this new arrangement. The journey from St. Petersburg to Vintimille was the longest continuous run made by any train on the Continent.

St. Petersburg (dep.)	6. 0 p.m.
Berlin (Friedrichstrasse, arr.)	10.55 p.m.
Berlin (Friedrichstrasse, dep.)	11. 0 p.m.
Cologne (Hauptbahnhof, arr.)	6.35 a.m.
Cologne (Hauptbahnhof, dep.)	6.42 a.m.
Paris (Nord, arr.)	3.25 p.m.
Paris (Nord, dep.)	4.13 p.m.
Vintimille (arr.)	10.23 a.m.

Distance, 2,211 miles. Speed, 33 m.p.h.
Time, 62hr. 22min.

This year, however, great changes were made in this service. The through carriages from St. Petersburg to Cannes now run viâ Warsaw and Vienna, being attached to the Vienna-Riviera express at Vienna. This route is some 300 miles shorter than that viâ Berlin-Paris, but the time occupied on the journey is actually longer. This is accounted for in some measure by the tremendous gradients of the Semmering line, over which the train travels as far as Brück (a distance of 108½ miles in 3hr. 34min.), and also by a stoppage of nearly four hours which the train makes in Vienna. The new schedule and timing are as follows:—

St. Petersburg (dep.)	6. 0 p.m.
Granica (arr.—St. Pet. time)	12 midnight.
Granica (dep.—C.E. time)	11. 0 p.m.
Vienna (Nordbahn, arr.)	7.25 a.m.
Vienna (Nordbahn, dep.)	7.35 a.m.
Vienna (Sudbahn, dep.)	11.25 a.m.
Cannes (arr.)	2.19 p.m.

Distance, 1,774½ miles. Speed, 26.08 m.p.h.
Time, 68hr. 19min.

This shows a deceleration of 5hr. 57min. in time and of 6.92 miles per hour as compared with last year.

The service from Switzerland is effected by the running of a through sleeping-car and one ordinary first-class coach between Bâle and Vintimille, viâ Geneva, Lyons, and Marseilles. The time occupied on the journey is, however, very long. A competitive train, running viâ the St. Gothard, Milan, and Genoa, might put a very different complexion on affairs.

Bâle (Gare Centrale)	8. 5 a.m.
Geneva (arr.—C.E. time)	3.15 p.m.
Geneva (dep.)	6.50 p.m.
Lyons (arr.)	10.47 p.m.
Lyons (dep.)	11.20 p.m.
Marseilles (arr.)	5. 0 a.m.
Marseilles (dep.)	5.15 a.m.
Vintimille (arr.)	11. 0 a.m.

Distance, 624 miles. Speed, 23.11 m.p.h.

This completes the through services to and from the Riviera. It will be seen from the foregoing analysis that England (via Calais), Switzerland, Germany, Austria, Russia, Holland, Belgium, and Italy are all served by direct through carriages, which fact will give some idea of the importance of the Riviera traffic. The services are all terribly slow when it is remembered that each train is an important international express, and in many cases

under 40 miles an hour over a level and easy road, it would be an infinitely harder task for a train to lose any considerable amount of time than for it to run strictly according to its schedule.

Along the Riviera itself, *i.e.*, from Marseilles to Vintimille, the traffic is simply of a swarming nature, while on the Cannes and Mentone section the trains are more frequent than on any London suburban line. The numerous



THE RAILWAY VIADUCT ACROSS THE TOWN OF MONACO

carries the mails. The "Nord Express" from St. Petersburg to Vintimille via Paris was unquestionably the best of them all, and possessed a very creditable running average indeed for a train which performed such a tremendous journey. It should be added that this train kept wonderful time—in fact, the merit of punctuality is the one virtue which the trains to the South possess. It is a very important one, but even absolute punctuality can be bought at too high a price, and with a booked inclusive express speed of

through trains from Marseilles to Vintimille are supplemented by very frequent "locals," or "omnibus" trains, as they are called, while there are two sets of special expresses which deserve description.

The only through train not described under one of the previous headings is the "Riviera Express." The train consists only of saloon cars and a restaurant car, and runs daily from Marseilles to Mentone and *vice versa*. It is primarily intended for those passengers who travel from Paris by the day service and

break their journey at Marseilles. They would stand but a poor chance, when resuming their journey next morning, of finding seats in the through trains from the North; and therefore this special service has been inaugurated for their benefit.

Marseilles (dep.) 11.37 a.m.
Mentone (arr.) 4.34 p.m.
Distance, 154½ miles. Speed, 30.8 m.p.h.

The two special sets of expresses just previously referred to are:—

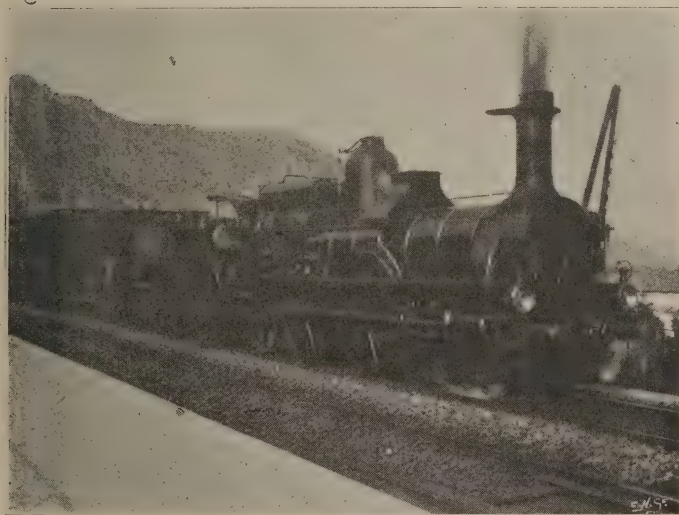
- (1) The Nice-Monte-Carlo "direct" trains.
- (2) The Nice-Mentone "express" trains.

The first service consists of trains which perform the journey between Nice and Monte Carlo in 24 minutes, stopping only at Monaco.

NICE AND MONTE CARLO.
Distance, 10 miles. Speed, 25 m.p.h.
Time, 24min.

The second service is made up of trains which run from Nice to Mentone; though labelled "Express" they stop at Villefranche, Beaulieu, Monaco, and Monte Carlo.

NICE AND MENTONE.
Distance, 17 miles. Speed, 25 m.p.h.
Time, 50min.



A TYPICAL RAILWAY SCENE ON THE RIVIERA

It is almost needless to state that the two sets of express trains mentioned above are first class only. The breathless speeds

at which they run could not be attempted by a humble "omnibus" train. The only mystery is how these "direct" trains manage to consume their booked time on the journey. But for the fact that a chronic block exists between Nice and Mentone, which enables them to come to a dead stop at every signal-post, they could not fail to arrive far in advance of their scheduled time. Series No. 1 is, of course, intended primarily for gamblers, and it is very difficult to obtain a seat in any of these trains, though they are despatched at comparatively short intervals. The local train service along the Riviera becomes hopelessly disorganised when any special pressure is put upon it, while the station staff is everywhere inadequate and disobliging. In short, no other example of so remunerative a traffic being so badly managed and inadequately coped with is to be found anywhere in the world. The one aim of the company seems to be to fleece the unfortunate traveller to the greatest possible extent, and to give him the smallest imaginable return for his money. The explanation is not far to seek, and lies in the fact that the P.-L.-M. are in the possession of an absolute monopoly, and the Sleeping-Car Company of a virtual one. Moreover, the Riviera traffic is derived almost exclusively from two classes of the community—*i.e.*, from rich people, to whom money is no object, and from invalids who *must* go to the South, and are therefore forced to pay any fare, however exorbitant.

There has been a small but nevertheless perceptible improvement in the services announced for the season 1898-99. The 11.15 a.m. first, second, and third class train, and the 2.15 p.m. first and second class train, to the littoral have each been accelerated by twenty minutes, and their hours of departure altered to 11 a.m. and 2 p.m. respectively. A

new train, first, second, and third class, leaving the Gare de Lyon at 4.10 p.m., has been put on, and the 9.30 p.m., first, second, and third class train, is now overtaken at Les Arcs by a new first, second, and third class train leaving Paris at 10.40 p.m. Both these new trains, though deplorably slow (in spite of their being marked "express"), show progress in the right direction—i.e., that of increased facilities in the way of faster trains to the Riviera, for all three classes, at ordinary fares. The 8.45 p.m. first class "rapide" has, moreover, been accelerated, or, to speak more correctly, will divide at Marseilles—the first portion running to Mentone as a fast train with the usual coast-line stops, whilst the second portion will follow half an hour later and be timed as the whole train was last year.

The establishment of a cheap through service to the Riviera, say, once a week, would pay the Company well, and confer an incalculable boon on hundreds of invalids who are debarred from the benefits of a sojourn in the South solely by the cost of the journey thither. I will conclude this article by drawing up a perfectly practicable time-table of some such service. The whole route from Calais to Marseilles is absolutely flat, with the exception of a short stretch in the neighbourhood of Dijon. The only obstacle to high speed is the defective condition of the permanent-way, and that, it is to be hoped, will one day be remedied.

Here, then, is the schedule of the proposed train. The fares given are calculated on a scale to correspond with those charged between London and Inverness, that being the longest

journey in Great Britain performed by through-carriages.

"IDEAL EXPRESS," CALAIS TO VINTIMILLE.

Consisting of first and second class sleeping-



THE DAILY "TRAIN DE LUXE" (SLEEPING AND DINING CARS ONLY) BETWEEN VIENNA AND CANNES

cars, and first, second, and third class corridor coaches at ordinary fares. Restaurant car attached from Calais to Paris (Nord), and from Marseilles to Vintimille.

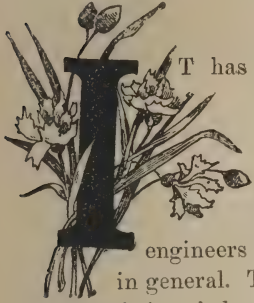
Calais (dep.)	2.45 p.m.
Paris (Nord, arr.)	6.15 p.m.
Paris (Nord, dep.)	6.20 p.m.
(Thence to P.-L.-M. Co.'s line, over Outer Girdle Railway, via Pierrefitte.)	
Cannes (arr.)	7.0 a.m.
Distance, 861 miles. Speed, 50 m.p.h. (Thence the usual stops to Vintimille.)	

Present (single) fare to Nice	£4 17 6
Present sleeping-car supplement	4 19 10
Total (single) fare	£9 17 4
Proposed (return) fare, based on that charged between London and Inverness	£7 10 0
Sleeping-car supplement, calculated on same scale	0 16 6
Total (return) fare	£8 6 6

Second and third class fares in proportion.

EXHAUST STEAM INJECTORS FOR LOCOMOTIVES

BY R. R. DODDS



IT has become so universal to utilise exhaust injectors for locomotives in place of pumps that the subject must possess an interest not only for engineers but the travelling public in general. The subject, touched from a popular view, is by no means without attraction, for it forms a very essential part of the development of the locomotive in its nearly perfected form in our day. The idea has been gradually worked out by experts, and has been for some years a constant source for scientific experiment by railway engineers; and, in its present application, the exhaust injector may be said to be as practical and successful in its working as any other adjunct of the locomotive.

The history of the injector itself has before, no doubt, been ably told, but it will suffer nothing by being briefly repeated. The injector was invented originally by M. Henri Giffard, and was adopted for commercial purposes in France so long ago as 1859; and to the late Mr. Charles Patrick Stewart, of the famous Manchester engineering firm of Sharp, Stewart and Co., the honour is due for its introduction into this country. The patent rights for Great Britain were secured by this firm, and they began to manufacture the injector from the designs of the inventor. So level-headed and far-seeing had M. Giffard been in his experimental designs that the important proportions of his invention have practically never been improved upon. In the year 1860, when the Giffard injector had been at work in France for nine months and

in England six months, the managing director of Messrs. Sharp, Stewart and Co., Mr. John Robinson, read a most interesting paper before the Institution of Mechanical Engineers, in the course of which he asserted that an injector had been obtained from M. Giffard, and after a trial upon a stationary boiler at their works had been fixed upon a ballast engine on the St. Helens Railway, and the driver had been able to dispense with the use of pumps, and maintained the level of the water at any desired height, whether the engine was running or not. It can readily be understood that the novelty of the apparatus and the apparent paradox of its action raised both astonishment and incredulity in the engineering world, and the possibility of an immense revolution in the economical working of the locomotive brought M. Giffard's invention into the utmost prominence.

The invention, in its working, proved to be an undoubted success, and its application to the locomotive was at once adopted.

In the early stages of locomotive boiler experiments the necessity of an apparatus by which the feed-water for generating the steam could be easily conveyed into the boiler was admitted as being of primary importance, and a system was at length adopted by which every locomotive was fitted up with a tank containing a supply of water in excess of that which was being turned into steam in the boiler. An ordinary force-pump for a time, driven by an eccentric fixed upon one of the axles, was the system adopted for forcing the water into the boiler, and this was the only practical means applied. Then followed the adoption of a more comprehensive idea—the

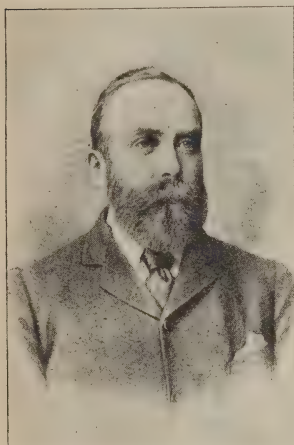
introducing of the water into the boilers by means of injectors; and a still later improvement was to pump hot water into the boilers. The late Mr. W. Stroudley, the Locomotive Superintendent of the London, Brighton and South Coast Railway, was one of the foremost railway engineers to adopt the hot water system, the water in the tanks being heated with exhaust steam. Since Mr. Stroudley's day engineers have patented and sought to perfect,



M. HENRI GIFFARD

The original inventor of the Injector

cal worker in our day, devoted much time and money in the development of this invention, though it is to be regretted that he did not live to see the full fruition of his hopes, so far as its general application to locomotives was concerned. Although associated with many immense undertakings, the development of this injector was his pet hobby. His labours, and those of his equally able partner, Mr. James Metcalfe, who is well known in the railway world,

THE LATE MR. EDWARD DAVIES
Of Llandinam

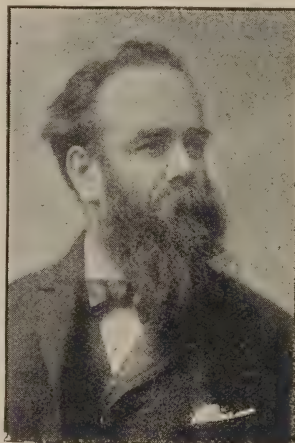
with more or less success, a process by which hot water can be discharged into a live steam injector with an initial velocity equal to the difference required to assure the succeeding combined jet to enter the boiler against the boiler pressure.

The newest and what promises to be the most successful injector yet patented, and which is rapidly coming into use on our great railway systems, is that made by the Patent Exhaust Steam Injector Com-

MR. JAMES METCALFE
Of Aberystwith

pany, of St. Ann's Square, Manchester, on Messrs. Davies and Metcalfe's patent.

This Company some years ago acquired Messrs. Sharp, Stewart and Co.'s injector business, and under the direction of Messrs. Davies and Metcalfe their experiments in the direction of arriving at an injector to utilise exhaust steam were watched by the engineering world with intense interest. Mr. Edward Davies, than whom probably there has been no more practi-

MR. A. SLATER SAVILL
Manager, Patent Exhaust Steam
Injector Co.

were ultimately rewarded by the invention of the flap nozzle, by which an entirely simple and reliable exhaust steam injector was attained.

The exhaust steam injector for locomotives can literally be described in a nut-shell, so that anyone who is not an engineer can grasp the utility of the invention. Here are its details:—

Whilst the two injectors forming the exhaust and live steam portions on a locomotive take practically just the same

amount of boiler steam to work them that an ordinary live steam injector does, yet the temperature of the water delivered into the boiler is 280 deg. Fah.; whereas in the case of an ordinary live steam injector under the same conditions the temperature entering the boiler is only about 160 deg. Fah.; hence there is a clear gain of considerably over 100 deg. Fah. added to the feed-water, due entirely to the exhaust steam which has been utilised in the process. In other words, the actual economy shown in the process is above 3lb. per mile in coal, as well as about 27lb. of water per mile run, due to the condensation of the exhaust steam; so, supposing the average daily run of a locomotive fitted with this injector is 250 miles, then the saving in coals is over 6 cwt., and the water saved is over 3 tons, compared with feeding the boiler by means of any kind of live steam injector. These economic results have been demonstrated by a series of carefully-conducted trials made on engines with and without these injectors, and are regarded in the engineering world as of a most satisfactory nature.

The point, however, that tells most favourably in the adoption of these injectors on locomotive engines is that the driver can feed his boiler when running with a heavy load and in bad weather without reducing his boiler pressure. The injector can be put to work at any moment, and thereby has a great advantage over a pump, which can only force water into a boiler when the engine is at work. Many middle-aged railway travellers will remember the cruel waste of time that was formerly occupied by engines having frequently to be uncoupled from trains to leave the main line and travel down sidings in order to pump water into their boilers. An eminent authority on railway matters thus describes the old state of affairs: "When an engine was hemmed in by other engines or vehicles so that there was no room for it to move, the plan often resorted to was to oil the rails, screw the tender brake hard on, and open the regulator. This caused the wheels to fly round on the slippery rail and thus work the pump and fill up the boiler,

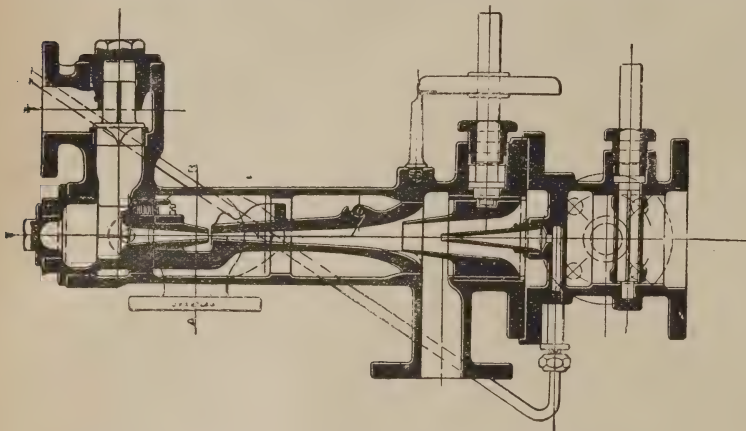
to the great detriment, however, both of the engine and of the rails upon which the wheels revolved."

The same authority, in discussing the merits of injectors as against pumps, said the day was not far distant when feeding-pumps would be superseded altogether by injectors. His anticipations are being realised to the fullest extent in our day, the fact alone that an injector is able to work when an engine is standing still outweighing everything that can be said for the pump. Beyond that the injector is thoroughly characteristic in its action, for by its use the steam taken from the boiler is practically the medium that drives the water into the same boiler against a greater pressure than its own.

A special recommendation of the Patent Exhaust Injector is in regard to the ascent of inclines, its patentees claiming that, under any climatic conditions, it can be worked in going up inclines without practically reducing the boiler pressure; whereas when the ordinary injector, under the same conditions, is put on to feed the boiler the pressure drops down very quickly. The result is, as may naturally be anticipated, that the driver is finding out that the one great desideratum he wanted under the worst conditions he has to contend with—viz., a heavy train, bad weather, and heavy roads—is this exhaust steam injector, by which he is enabled to keep up to time and show a satisfactory result of his work. It is almost needless to say that the patentees of the new exhaust injector have received the most abundant testimony as to the value of their new patent, and the most valuable, no doubt, is the unsolicited testimony of several experienced drivers who have given it a thorough test. One of the drivers, having had a full experience of it, goes so far as to express a hope "that the Patent Exhaust Steam Injector will become the standard injector for all locomotives."

In Mr. Savill, the Manager, the Patent Exhaust Steam Company are fortunate in possessing an experienced and scientific man, who has been connected from the outset with the exhaust steam injector experiments,

and he can be credited with having done his utmost to convince not only the engineering world but the public of the enormous value of this invention. He has read papers as to its utility before the Institution of Mechanical Engineers, the Cleveland Institution of Engineers, the North Staffordshire Institute, and the Manchester Association of Foremen and Draughtsmen; and he prides himself most, of course after unceasing hard work, on



EXHAUST PORTION OF PATENT EXHAUST STEAM INJECTOR

the fact that the invention is now rapidly getting into general use on locomotives, and that drivers all round, as the Yankees say, "swear by it."

We understand that these injectors have been used with very much success—principally on express passenger engines, as well as on goods engines—on the systems of the Great Western Railway Company, the North Eastern Railway Company, the Great Northern Railway Company, the Great Eastern Railway Company, the Cambrian Railways Company, the Barry Railway Company, the North British Railway Company, the Glasgow and South Western Railway Company, and other English railways, and on many Continental railways. One English railway, after trying the injectors for some time on eight engines, ordered injectors for twenty more locomotives. Another great railway at present has two hundred of the injectors in use.

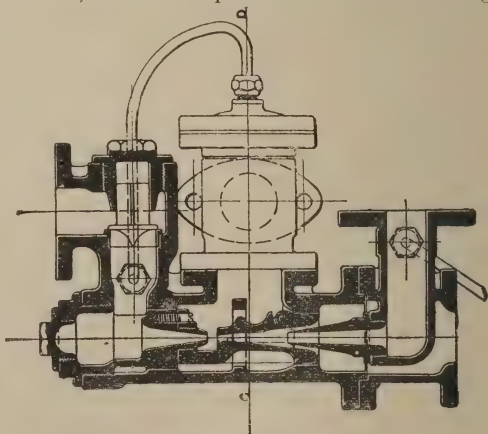
No doubt one of the greatest testimonies to its value was the fact that the splendid engine

of the Great Northern Railway, No. 990, built from the designs of Mr. Ivatt, was fitted with Davies and Metcalfe's Patent Exhaust Injectors, manufactured by the Patent Exhaust Steam Injector Co., Limited, at their extensive works at Romiley. The "Bull-dog," the latest type of engine on the Great Western Railway, is also fitted with it.

The owners of the patent have issued an exceedingly clear series of diagrams as to the

scientific details of the injector, which must be interesting to practical engineers and drivers. They show at a glance the temperatures of the different jets by means of colours. By these it is seen that a branch pipe conveys a body of exhaust steam from the base of the blast-pipe to a separating chamber, where all greasy matter and condensed water is collected, the dry portion passing along to a set of injector cones in the exhaust

portion of the injector, where it comes in contact with cold water from the tender. Then follows sudden condensation, and the jet of steam and water combined rushes forward, with a temperature of from 180 deg.

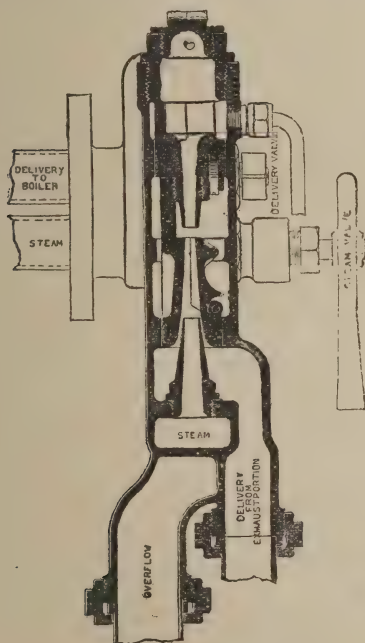


SUPPLEMENTARY LIVE STEAM PORTION

Fah. to 200 deg. Fah., until it arrives at the second or supplementary part of the apparatus. Then it enters a small live steam injector,

where it receives the impulse obtained from the partial condensation of steam sufficient to carry it past the clock-valve into the boiler. In practical operation the feed-water from the tender is first turned on. The exhaust steam is then admitted into injector No. 1 by opening the wing-valve, and the water is regulated until no overflow comes from it. The supplementary steam is admitted to injector No. 2, and then all the hot water delivered to it is taken up and injected into the boiler.

Messrs. Davies and Metcalfe give some further details of a more technical description. The injector is in two parts—the first portion being worked by the exhaust steam. This takes the feed-water at ordinary temperature, and by means of *exhaust steam only* heats it up to boiling point. Here is practically the economy, for if the feed of water is 50 deg. Fah. there is about 150 deg. Fah. added to it,

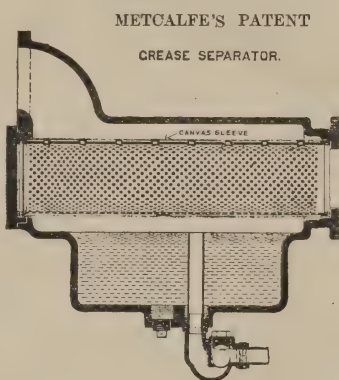


SUPPLEMENTARY PORTION
ARRANGED AS A COMBINATION INJECTOR

and this is done instantly and in quantities sufficient to feed the boiler. In addition to heating the water a pressure of 70lb. is given to it. This, however, not being sufficient

pressure to enter the boiler, the water is delivered at the temperature and pressure mentioned to a supplementary injector worked with boiler steam. This injector further heats the water to a temperature of 280 deg. Fah., and it enters the boiler. Both injectors are perfectly automatic, and are reliable and exceedingly simple to start. The injectors are provided with self-contained, back-pressure valves.

The flap nozzle, as applied to the exhaust steam injector, has been proved by experiment to be so perfectly automatic in its action that it has been applied to the ordinary pattern



non-lifting live steam injector, which it converts into a lifting automatic re-starting injector. This differs from the exhaust steam injector principally in the proportions of the nozzles

and the absence of the steam concentrating spindle. When steam is turned on, after issuing from the first cone it enters the second and pushes the flap open, thereby securing a large area of outlet, which enables it to exhaust the water-pipe and raise the water. On the water's arrival the steam is at once condensed, the pressure in the overflow of the chamber closes the flap, and the injector starts. Should, however, the water stream be broken by any cause, the flap opens, the water is again drawn up, and the injector starts again.

One great advantage of the flap nozzle is that it can be instantly withdrawn and examined without breaking any joints.

Then, again, Messrs. Davies and Metcalfe have patented what is known as a supplementary combination pattern, being a modification of the live steam portion of the invention. This is made for convenience of

fixing to bolt to the back of the fire-box of locomotives, and it is usual to place side by side with it an automatic re-starting injector similarly arranged.

Our illustrations also include a grease separator. To prevent any grease or deposit from the cylinders entering the boiler and reducing its evaporative power, the exhaust steam as it comes from the blast pipe passes through Metcalfe's patent grease and water separator, now used on all locomotives with the exhaust steam injector.

The Patent Exhaust Steam Injector Company, in addition to the exhaust steam injectors, manufacture all kinds of special machinery. In 1892 they manufactured some special large spur gearing and coining machines for the Government of Afghanistan,

which are now at work at the Afghan Mint, Cabul. Owing to the difficulties of transport the large wheels had to be built in separate parts. The largest wheel was made up of no less than thirty-eight parts, and weighed four and a half tons. Sir Salter Pyne, the Ameer's Engineer-in-Chief and Master of the Mint, afterwards wrote:—"The heavy gearing you supplied us with is doing well. The work was very intricate and difficult, but the wheels went together easily, and have given no trouble. I am very pleased indeed that other orders from Cabul have fallen into your hands."

For the Barry Railway Company they manufactured an exceedingly interesting locomotive valve port facing machine. Another speciality is their gun-metal steam fittings.

THE SEVEN AGES OF THE ENGINEMAN

(With apologies to William Shakespeare.)

All the world's a shed,
And all the enginemen are railway servants,
With their "free passes" and their "grievances,"
And each man in his turn runs many miles,
His shifts being seven changes. First, the cleaner,
Rubbing and scouring 'neath the gaffer's eye.
And then the fireman, trimming his head lamps,
With shovel deftly used, stoking with care
To make his engine steam. And then the "passed man,"
Firing or driving, with a goodly record,
Certain for quick promotion. Then "full driver";
On the pilot and shunting in "the yard,"
Taking his signals, ready and prompt in action,
Marshalling the loads, "thro' goods" or "pickups,"
Under the shunter's care. And then the "goods man,"
In a train "link," and with his trips defin'd,
With "his own engine and a reg'lar mate,"
Full of "repairs," "reports," and "running sheets";
And so he works his shift. The sixth change comes
On to the "slows" and "express passengers,"
With "highflyer" to work and run to time,
His trusty "steed," well driv'n; known far and wide
For a smart hand; with his keen, watchful eye
Quick on the footplate seeing "danger," stops
And whistles for "the board." Last scene of all
(The tail-light of this good man's history),
Comes recognition of a life well spent
In a well-earned superannuation.

N. E. STILUS.



THE COUNTRY TERMINI OF THE (LOCAL) LONDON RAILWAYS

RAILWAY COMPANIES.				ERMINI.
Metropolitan District Railway	...	...	...	{Richmond, Ealing, Wimbledon.
Metropolitan Railway	...	...	...	Richmond.
North London Railway	...	...	...	{Richmond. Kew.

By W. J. SCOTT, B.A.

“**W**HERE does the frog go to when he goes out of the world?”—the water-world, that is—asked a pond-dwelling larva in one of Mrs. Gatty’s tales, and on being told that he went into the air-world the questioner wondered but doubted. So one is often asked during an “Underground” journey, “Where do these trains go to when they leave the Tunnel?” When told that some of them pass out of the sulphur-cum-sewer world into green fields (real fields) and fresh air, some hearers give a sigh of relief, others shake their heads unbelievably, and say their aunt from the country once went round and round for eight hours, and was alive at the end only through a mistaken excursion to Addison Road *en route*. Since, however, a good many of the said trains do really escape from the “Circle,” and even the confines of London, a fuller answer to the question, such as this article attempts to give, may be of some interest.

The opening heading shows what one

means by “the London local” lines; as a definition of “country” it is simplest to take everything outside the bounds of “Londonshire,” which, be it noted, is now a true (though new) geographical county as much as Devon or any other shire [see the new Ordnance Survey maps *passim*]. This definition cuts out Hammersmith (Metropolitan) and Putney Bridge (District) at one end, and New Cross at the other, since these termini, though off the “Circles,” are within the County of London.

As a joint owner of the Hammersmith and City line, the Metropolitan Company holds running powers between Hammersmith (Grove Road) and Richmond by the South Western Company’s “Kensington, Hammersmith and Richmond” line. Under these powers an hourly service is run from New Cross or Aldgate, but as the Great Western Company now works half of this the number of Metropolitan trains in and out of Richmond is only eight. The District Company send from two to four trains an hour past Fulham and

(by means of a bridge at Putney) over South Western territory to Wimbledon. They also run five or six an hour on to the aforesaid Hammersmith and Richmond section, just east of Ravenscourt Park. Of these, one or two follow the above route to Richmond, while no less than four an hour pass off the South Western territory a few minutes after entering it, and get back on to their own property in the Ealing Extension. Of these, not all reach Ealing, since some sixteen or so stop short only a few hundred yards over the

of its trains even reaching the most northern extremity of Middlesex at Potter's Bar.

It will thus be seen that all three Companies have Richmond (new station) as a terminal point; it is also the case that they all find their way out of the London smoke by the help of the South Western Railway. Even the just-mentioned case of the North London services is not a true exception to this rule, since the Broad Street authorities hold no powers north of Finsbury Park, and only run beyond that point as agents for the Great Northern Com-



border at a station near Turnham Green Church, formerly called "Acton Green," and now styled "Chiswick Park."

That most ancient of metropolitan lines, the North London, whose beginnings date from 1846, has absolutely no territory of which it is sole owner outside the bounds of London. It is, however, the joint owner and practical administrator of a line in Middlesex which brings its trains to Kew and Richmond; while, by leave of the Great Northern, it also runs services so far afield as Alexandra Palace, Enfield, and the Barnets—five or six

pany. Kew affords a seeming exception also, but, as will be seen when we deal with that place, the present terminus of the North London there is on South Western ground.

Of the four terminal places the last-named, though far the smallest—it is only a village—is known the world over for its Gardens and its Observatory.* The other three have a curious likeness to each other in population, distance from London, recent growth, and railway accommodation; indeed, it would be

* Though named from Kew, the famous Observatory stands in the Old Deer Park, Richmond.

hard to find any three towns in England within a few miles of each other so similar in importance and status. Each has a population of something over 30,000, each has grown up in the past 50 years from small though ancient beginnings—Ealing and Wimbledon from actual villages, and Richmond from a quite small town overshadowed by its

men, A.D. 568,* to the opening of the South Western main line in 1838, the place has no history worth telling. It was but a small Surrey village, standing upon its "dun," until the second half of this century, its railway station lying in the valley below nearly a mile away. After that a new suburb, sometimes called South Wimbledon, grew up round the station till it touched the historical (but squalid) Merton in one direction, and in the other pushed a line of houses and shops up a hilly road into its parent village on the "Ridge-way." The two are now fused into an incomplete but considerable town, with a great fringe of fine villas and detached houses on its northern and western sides. The original parish church (St. Mary's) has now two daughters with full parochial rights, besides three chapels-of-ease, within its own district; in all there are seven or eight churches in

the urban district. None of these are striking architecturally,† nor very conspicuous objects in the town. In this respect they are eclipsed by the local banks, of which there are many; one of these, the London and County, has a building of stone and terra-cotta in a kind of Romanesque style, which would catch the eye even in a great city. At present it stands—queerly enough—at the corner of a grass field; this is characteristic of Wimbledon's unfinished condition. Other noticeable buildings are the Free Library, the Post Office (hidden away in a side road, but of some size), and the rather disappointing Public Offices—with a good clock, but not much else to mark them as the municipal headquarters. Many of the shops are handsome, but as yet there are no

* Green says this was the first battle between the English tribes. It settled the question as to Surrey being a Wessex, not a Kentish, possession.

† This does not apply to the Roman Catholic new church, which, though not yet complete, is a striking object, with its fine apse and flying buttresses.



EXTERIOR OF EARL'S COURT STATION, DISTRICT RAILWAY

mother parish, Kingston—and all three seem to have a thriving future before them. They are commonly spoken of as "suburbs"; no doubt they are "suburban" in the sense in which Red Hill, Maidenhead, or even Brighton may be called suburban. But two of them stand practically in open country; even Richmond, the least rural of the three and most linked to London, has all the municipal buildings, the courts, the clubs, and the public institutions of a thriving provincial borough, while all three towns have a strong local life of their own.

We will take them in order, beginning from the south, and therefore with

WIMBLEDON.

The name, said to be a modern form of Wibba's Dun, takes us back to the days of the West Saxon conquest of Southern Britain, but from the time when a Kentish army, under Ethelbert, was beaten there by the Wessex

good streets. At the present rate of progress, however, in ten years time the town bids fair to be one of the finest within thirty miles of London, with a population of over 50,000; to-day it is estimated at something over 35,000. Though lying within a mile or so of the London county border, which here juts out rather far (along Beverley Brook) into Surrey, it is only on its north-eastern edge, towards Haydon's Road, that Wimbledon is approached by any continuous line of houses from London. It is sundered on the north from Putney by nearly two miles of common and heath, and by a like distance of open, wooded ground—Wimbledon Park—from Wandsworth. Doubtless this position in open country, with Richmond Park only a mile and a half away, and the Epsom Downs within an easy walk, was the first cause of a growth in the seventies and eighties, which the abundant train service of recent days has still further quickened.

Ten years after the opening of its station—*i.e.*, in 1848—Wimbledon boasted of nine trains each way daily, all of them to and from Waterloo. The last down left London at 6.30 p.m., and there were no afternoon ups from 1.10 to 4.21; to-day there are thirteen to Waterloo alone during the same hours, besides some six District and three Brighton Companies' trains to Earl's Court and London Bridge respectively. It was not until the opening of the Tulse Hill and Tooting joint lines, in 1869, that any great rise in Wimbledon's importance as a railway centre was established. The new lines brought it at a stroke a service of London Bridge and Victoria trains from the London, Brighton and South Coast Railway, and one from Ludgate Hill and intermediate Chatham stations worked by the South Western. At first, however, Wimbledon was not used as

the starting station, nor to any great extent as the junction, for either service. Almost all the Ludgate trains work on to Kingston Town (high-level platform) *viâ* the junction at New Malden, while the Brighton Company's trains ran round, as they still do, by the curious loop at Tooting, from London Bridge (*viâ* Haydon's Road) to London Bridge (*viâ* Merton), or *vice versâ*, simply calling at Wimbledon as an intermediate station on the way. In later years the Ludgate service has taken Wimbledon as its terminal junction (in a few cases the trains come in by Merton and run forward along the other half of the loop to Haydon's Lane), while the Kingston high level line is used for a numerous service of trains from Waterloo to Teddington, Twickenham, or "roundabouts" through to Waterloo again by Barnes; except one or two, all these call at Wimbledon. The Brighton



EXTERIOR OF PUTNEY BRIDGE STATION, DISTRICT RAILWAY

Company's branch from Croydon by Mitcham, having Wimbledon for its terminus, and the South Western line to Epsom and Leatherhead were both made many years ago—not less than forty—the former was of no value as a way to and from London; the latter, which branched off at the point where Raynes Park Station now stands, was served by a

wholly independent service of trains to and from Waterloo.

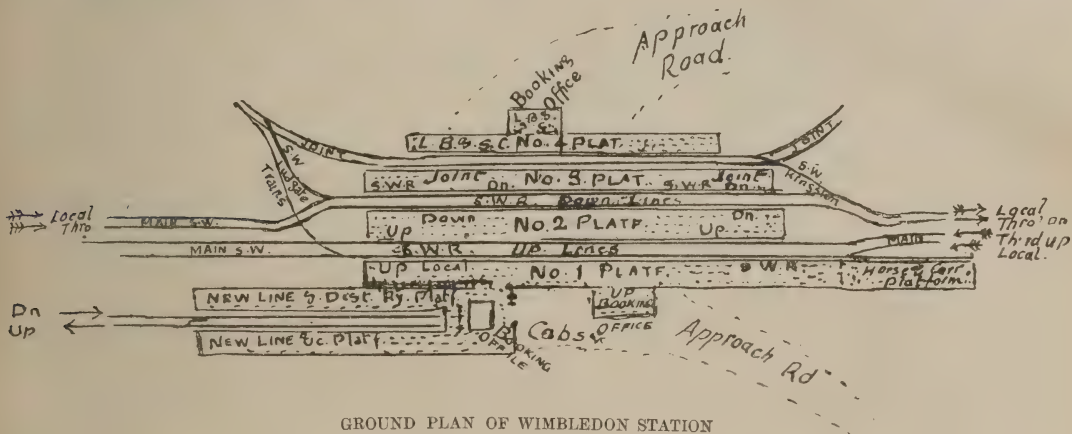
In June, 1889, the South Western Company opened a branch out of their Windsor line, near Wandsworth, to a junction with their main line by the existing Wimbledon Station. A spur out of this at Putney East joined the Fulham Extension of the District by a bridge over the Thames close to the terminus of the latter. The District at first gave a half-hourly supply of trains, which has been raised in the "business" hours to a fifteen-minutely one. Thus Wimbledon became the most southern and one of the most important of the "country" termini of the District Railway [see map on page 76].

2.—AT JOINT PLATFORM.—TO TOOTING AND BEYOND.

To Ludgate Hill viâ Tulse Hill ...	14
From and to London Bridge (one to Victoria), "roundabouts," L.B. and S.C. trains ...	17
TOTAL	31

3.—AT "NEW" PLATFORMS (Putney Line).

To Earl's Court (and Kensington High Street), Mansion House, and White-chapel—District Railway trains ...	47
To Waterloo (North Station) viâ Wandsworth ...	15
TOTAL	62



GROUND PLAN OF WIMBLEDON STATION

In more recent years several of the main or Portsmouth line fast trains, including one first-rate up express from Exeter and a like one from Bournemouth, were given Wimbledon "stops," and the station as a junction is now a very important one. Its present train accommodation we can only set forth in tabular form. [For convenience we have taken the *up* trains—the down ones are nearly the same.]

TABLE OF WIMBLEDON TRAIN SERVICES.

1.—AT MAIN LINE PLATFORMS.—TO WATERLOO.

Main or Portsmouth express or fast ...	8
Ditto stopping, or Chertsey, Hampton Court or Kingston lines ...	61
Suburbans (including two locals from Wimbledon), Leatherhead and Epsom branch ...	19
TOTAL	88

WHOLE NUMBER OF TRAINS TO LONDON.

London and South Western ...	117
District ...	47
Brighton and South Coast ...	17
TOTAL	181

BRANCH TRAINS TERMINATING AT WIMBLEDON.

(UP)	
From Kingston line ...	2
From Leatherhead ...	1
From Sutton viâ Mitcham, L.B. and S.C. (summer only) ...	5
TOTAL	8

BRANCH TRAINS STARTING FROM WIMBLEDON.

(UP)	
To Haydon's Lane, L. and S.W. trains ...	2
To Croydon, L.B. and S.C. ...	11
TOTAL	13

TOTAL OF UP TRAINS AT WIMBLEDON STATION

Summer months ...	202
October to June ...	197

Of which number 94 start from (or end at) Wimbledon, including all the Putney line trains of both Companies, the Croydon branch, and 14 to Ludgate,* and 108 call as at an intermediate station.

Unlike Croydon, Ealing, and Tottenham, Wimbledon does not boast a number of separate stations, so that the figures for "The Station" give the whole service which the town enjoys. Merton Park and Haydon's Road Stations are on the southern and northern outskirts of the new half of the town, and a villa suburb, known as Cottenham Park, reaches out almost to Raynes Park, but all these stations really belong to and are meant to serve other places. "Wimbledon Common" Station, on the Putney line, bears much the same relation to Wimbledon itself as "Beckenham Hill," on the Catford loop of the London, Chatham and Dover does to Beckenham; that is, they are somewhere in the neighbourhood of, but quite detached from, the towns they are named from. The plan on page 79 shows that "Wimbledon" Station is a considerable one.

THE DISTRICT "WIMBLEDON EXTENSION."

In strictness, this consists only of the few yards between Putney Bridge Station (the end of the Fulham Extension) and the Putney

Railway Bridge, where London and South Western territory is entered. For about three-quarters of a mile, however, to East Putney Station, the line is used solely by District Railway trains. Of the 47 trains which start from Wimbledon, the greater number run to Whitechapel (Mile End terminus), one or two stop short at Earl's



VIEW LOOKING UP WIMBLEDON HILL

Court, and a dozen or so—including most of the later evening ones—go round the "spur" into High Street, Kensington, giving a connection there with the Metropolitan line. The coaching stock is the usual four-wheel "pill-box" style, which is, unhappily, the standard (and only) pattern on the District Railway. The train working is, as elsewhere on this system, smart and, when foreign companies do not hinder, decidedly punctual.

With Kew and Richmond we hope to deal on the next occasion, ending up with Ealing, and a general summary of running powers of the three Companies and a comparison of their services, etc.

* This is the whole number of up Ludgate trains, but of the down ones three work through to Kingston.



SOME NEW GREAT NORTHERN ENGINES

By CHARLES ROUS-MARTEN



LARGE coloured picture of the most remarkable of the new engines designed and built for the Great Northern Railway by Mr. H. A. Ivatt, the able Locomotive Superintendent of that

line, was published in the December number of the RAILWAY MAGAZINE; also there were given the chief dimensions of the engine, and some notes of a run made by myself with it, these being reprinted from my article on the subject in the "Engineer." I purpose in the present article to give details of a later, and, perhaps, in the circumstances, still more noteworthy run with No. 990, and also to give some account of other new engines which have been placed on the Great Northern Railway by Mr. Ivatt since his advent to Doncaster.

Coming from a quiet, easy-going railway like the Great Southern and Western of Ireland to an impetuous, high-pressure, energetic, go-ahead line such as the Great Northern of England, many men would have been almost dazed and bewildered by the perpetual rush and dash of a railway whose standard speed for expresses is not the dignified old forty miles an hour, but anything you like so long as it is above fifty. But Mr. Ivatt quietly fitted himself at once to his surroundings, and promptly recognised that a new and difficult problem which had been steadily building itself up for some years met him with an imperative demand for its immediate solution. He calmly set himself at once to devise the solution. No. 990 is one of the results of his excogitation. But it is not the only one.

It has always been the good fortune of the Great Northern throughout its fifty years'

history to possess a Locomotive Chief Engineer who could see the urgent need of providing locomotive power not merely for the daily requirements of the time being, but also adequate to grapple with the increment of traffic that was certain to accrue year by year. And, as a result, this progressive railway up to 1894 always had engines capable of doing as well as possible all that they were called upon to do, and also having a reserve of force in case of emergency. It was so under Mr. Archibald Sturrock, it was so under Mr. Patrick Stirling, and I think there are already sufficient indications that the case will not be different under Mr. Ivatt. The "Large Hawthorns" and "Converted Cramptons" and No. 215 of Mr. Sturrock's earlier period, and the 7ft. coupled (Nos. 264-269) and 7ft. singles (Nos. 229-240—now on the "A" list) of his later days were in most respects ahead of anything then running. Mr. Stirling carried matters steadily forward, first with his 7ft. singles (No. 4 class), and then with his famous 8ft. and 7ft. 6in. engines. All these in turn tackled with entire success everything in the shape of speed and load that the period offered.

But the summer of 1894 demonstrated all too conclusively that a new era had arrived. The splendid 8ft. engines designed in 1869 had kept abreast of their duty for twenty-five years, but they were now mastered by the enormous loads that had to be hauled at average speeds which were never dreamt of for such trains when the engines were planned. For the first time in their history of a quarter of a century they had to submit either to the indignity of being "piloted" or to the humiliation of losing time.

Mr. Stirling rose to the occasion. He at

G

once began to build his "1003" class of 8ft. singles with 19½in. cylinders and 170lb. of steam, and with 20 tons on the driving wheels. These giants simply skipped along with heavy trains at any speed you liked, and it seemed at first as if the problem were solved. Unfortunately, the loads grew even faster than the engines ran. Also the great weight on a single pair of wheels was found detrimental, and had to be reduced, which necessarily diminished the power obtainable through adhesion, and so only about 19 tons could then be used compared with 30 to 32 tons available to modern coupled engines. That Mr. Stirling would

coupled class with cylinders 17½in. by 26in. It has always appeared to me that this view has arisen through the engines being employed upon work for which they were not intended. Mr. Stirling has often remarked to me that he hated to see coupled engines on fast trains. Yet he must have sanctioned their use in this way, for, although the bulk of Great Northern express work was done by the single-wheelers, some of the expresses were regularly and systematically run by the coupled engines. And I may say frankly that my experience—tolerably large—with them in this sort of work has almost always been the reverse of



"No 873," ONE OF STIRLING'S 7FT. 6IN. "SINGLE" INSIDE CYLINDER EXPRESS ENGINES, AS REBUILT BY MR IVATT, WITH DOME, ETC.

again have risen to the occasion had he been spared I entertain no doubt whatever. But, unhappily, when only six of the new engines had been built their author passed away.

So Mr. Ivatt, as I have said, found himself immediately on his succession to the Doncaster chieftainship confronted with the grave fact that the traffic had outgrown the locomotive power, and with the problem—how could the latter best be augmented?

There was one locomotive type which was introduced by Mr. Stirling that has generally been regarded as much less successful than any other which he originated, although its representatives are perhaps the most numerous of all. I refer to the 6ft. 6in.

satisfactory. They could do very well with heavy stopping trains or fast goods trains, and it was for this work that in reality they were designed. I have also known them run *light* fast trains smartly enough. But with *heavy* fast trains I have never found them do well. Indeed, *a priori*, I have never been able to see how they possibly could do well in such work with such small boiler power. Their long, rigid wheel-base was another drawback.

Evidently this same view of the case must have struck Mr. Ivatt, for his first proceeding was to try an engine of much the same general design, having identical dimensions of cylinders and coupled wheels, but a much larger

boiler and higher steam pressure and having a four-wheeled bogie under its leading end. The pioneer of the class took the place of an old goods engine broken up, and bore its number, "400," which is now the designation of the class. Mr. Ivatt pointed out to me very distinctly that this type was not intended as a new class of express engine, but was meant for the same work as that for which Mr. Stirling designed *his* coupled class, only as engines of that class were often called upon to take express trains the new ones would be better fitted for that duty by virtue of their enlarged boiler power and leading bogie.

This has proved to be the case. The type has been multiplied; there are, I believe, thirty more of the class, numbered 1071-1080 and 1301-1320, now at work. It has recently been improved by a still further augmentation of boiler power. The enlarged engines are numbered 1321 and onward, No. 1327 (shown in illustration) being the latest up to the time of writing. In these massive-looking engines the boiler diameter has been augmented by 3in., so that it bulges out over the splashers as do those of the Caledonian Dunalastair class, and the heating surface is increased from 1,123 sq. ft. to 1,250 sq. ft., while the fire-box is greatly enlarged, having 120 sq. ft. instead of 103. This enlargement of the fire-box has involved a lengthening of the side rods and coupled-wheel base by 9in. The fire grate area is 20.8 instead of 17.8in. in the smaller engines. The chimney is much shorter, owing to the size of the boiler, and it is built up in three pieces, as will be observed in the illustration.

A run with the 5.30 up dining car from Leeds, one of the smartest on the line, will illustrate how well the 1301 class can perform. Starting punctually from Leeds with a load of

154 tons behind the tender, the engine easily climbed the ascent of 1 in 50 towards Holbeck. Starting thence a stiff bank at 1 in 100 for four miles has to be mounted. This was done at a steady 40 miles an hour, a smart descent to Wakefield following. Here the load was augmented to 223 tons, with which the new coupled engine started off briskly up the long incline of 1 in 150 to Nostell Summit, the speed never going below 45 miles an hour. The subsequent descent to Doncaster afforded convincing proof that the new engines could run fast and freely as well as pull big loads uphill. Descending the gradient of 1 in 200 the speed rose successively to 75, 76.6, 77.2, 78.2, 79.4, and finally to 80.3 miles an hour. The total run from Wakefield to Doncaster, practically 20 miles, occupied only 21min. 19sec., including the long climb at 1 in 150. The 12 miles of downhill and level from passing Hemsworth to the stop at Doncaster were run in 10min. 27sec. This is very smart work. On another occasion one of the same class took a load of 291½ tons from Newark to York (68 miles) in 81min. 2sec. with two checks beside the bad slack past Selby.

In this instance the engine with that heavy load averaged 45.5 miles an hour up the bank



"No. 1312," ONE OF MR. IVATT'S EARLIER DESIGN OF FOUR-COUPLED ENGINES, WITH A LEADING BOGIE; FOR THE GREAT NORTHERN RAILWAY

of 1 in 200 to the summit at Askham Tunnel. I may mention here that, in accordance with my invariable rule, all my loads are reckoned as exclusive of the weight of engine and tender—manifestly the only accurate and scientific method of computation for the purpose of testing locomotive work.

The following is the "log" of my run with the Leeds "diner" from Holbeck to Doncaster:—

Distance ex King's Cross. Miles. Chains. *	Stations, etc.	Times.
185 16 $\frac{1}{4}$	Holbeck.....	dep. 5.33.32
183 20	Beeston.....	pass 37.31
180 8 $\frac{1}{2}$	Ardsley.....	pass 42.11
178 19	Lofthouse.....	pass 44.11
175 64 $\frac{3}{4}$	Wakefield.....	{ arr. 46.54 dep. 51.12
174 12	Sandal	pass 54.06
170 28	Nostell	pass 59.15
167 66 $\frac{1}{2}$	Hemsworth.....	pass 6.02.04
164 49	South Elmsall ..	pass 4.55
162 33	Hampole	pass 6.40
159 78 $\frac{1}{4}$	Carcroft	pass 8.39
155 76 $\frac{3}{4}$	Doncaster	arr. 6.12.31

* Distances are as given in new appendix to working-book.



MR. IVATT'S NEWEST AND LARGER CLASS OF EIGHT-WHEELED 6 FT. 6 IN.
COUPLED EXPRESS ENGINE, WITH LEADING BOGIE

As to the excellent work done by the three classes of Mr. Stirling's single wheelers as rebuilt by Mr. Ivatt—the 7 ft., 7 ft. 6 in., and 8 ft. types—I do not purpose to write now; those classes may be more conveniently dealt with separately. I therefore content myself with illustrating one of the two latter classes, and proceed to describe my latest experience with the most novel and interesting type of all, the already famous, but at present solitary, No. 990. It is unnecessary to add anything to the particulars as to her design and construction which appeared in the December number of this Magazine. I will simply offer a specimen of her work which has not hitherto been published.

Leaving York with the so-called "Flying Scotsman" express 2 $\frac{1}{4}$ min. late, we had a load of no less than 293 tons behind the tender without reckoning the weight of passengers and luggage. Nevertheless No. 990 got away

with it so readily that Naburn (4 miles 12 $\frac{1}{2}$ chains) was passed in 6 min. 34 sec. from the start; Selby, going dead slow, after a bad check at Osgodby, in 16 min. 3 sec. for the 13 $\frac{3}{4}$ miles, and Doncaster, at reduced speed, in 36 min. 44 sec. for the 32 $\frac{1}{4}$ miles from the start. Most of the distance, it is true, is almost a dead level; nevertheless, this was admirable running with such a load.

At Doncaster a bogie coach was slipped, reducing our load to 271 tons. Speed was slackened through the station, but soon rose again, and Retford was passed in 54 min. 12 sec. from York (49 $\frac{1}{2}$ miles); 17 min. 28 sec. from Doncaster, 17 $\frac{1}{2}$ miles. Good work was done up the following bank of 4 miles at 1 in 178 to

the short Askham Tunnel, the speed never dropping below 50 miles an hour, and the 5 $\frac{1}{2}$ miles of falling gradient from Tuxford to Carlton were covered in 4 min. 53 sec. Carlton Station was passed in 67 min. 54 sec. from

York, the distance being 61 $\frac{3}{4}$ miles, no allowance being made for two signal slacks, which caused a loss of 1 min. 10 sec. If that loss be deducted the net time is shown to be 66 min. 44 sec. The reason I give the time so minutely to this passing point is that directly after passing Carlton Station the driver, finding that he would be at Newark before his booked time, promptly eased down to 50 miles an hour and went under easy steam all the rest of the way. As it was, the run of 82 $\frac{3}{4}$ miles from York to Grantham was done in 94 min. 26 sec., of which 1 min. 10 sec. represented the loss by signal slacks, and certainly three if not four minutes the time intentionally sacrificed at the end owing to the engine having run under easy steam during the last 21 miles, which consequently occupied 26 $\frac{1}{2}$ min., instead of taking only 22 min. as on the former occasion of my testing it over that same distance. This was done owing to the train having run

under time for three-quarters of the distance.

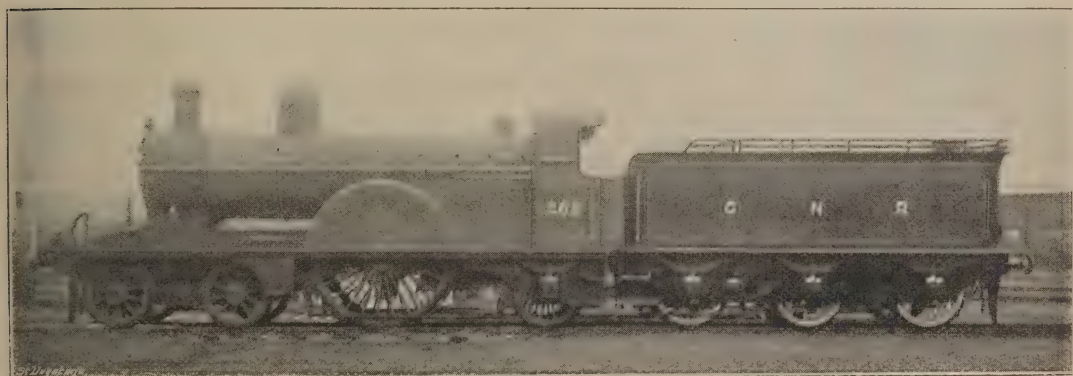
The "log" of the run is as follows:—

Distance ex King's Cross. Miles. Chains.*	Stations, etc.	Times.
188 13 $\frac{3}{4}$	York dep.	2.47.16
184 1 $\frac{1}{4}$	Naburn pass	53.50
181 11 $\frac{1}{4}$	Escrick pass	56.40
178 41 $\frac{1}{4}$	Riccall pass	59.13
	(Check at Osgodby Box.)	
174 33 $\frac{3}{4}$	Selby (slack)..... pass	3.03.53
169 61 $\frac{3}{4}$	Templehirst pass	10.11
165 76 $\frac{3}{4}$	Balne pass	14.17
163 1 $\frac{3}{4}$	Moss pass	17.07
160 14 $\frac{3}{4}$	Shaftholme pass	19.52
158 5	Arksey pass	21.58
155 76 $\frac{3}{4}$	Doncaster (slack) pass	24.00
151 25	Rossington pass	29.10
147 56	Bawtry pass	33.37
145 65	Scrooby pass	35.24
143 76	Ranskill pass	37.10
141 58 $\frac{3}{4}$	Sutton pass	39.19
138 49 $\frac{1}{2}$	Retford pass	41.28
131 72 $\frac{1}{2}$	Tuxford pass	50.17
127 30 $\frac{3}{4}$	Crow Park pass	54.18
126 31 $\frac{1}{4}$	Carlton pass	55.10
	(Eased down.)	
120 8 $\frac{1}{4}$	Newark pass	4.02.33
115 30 $\frac{1}{4}$	Claypole pass	8.00
111 42 $\frac{3}{4}$	Hougham pass	13.16
109 54	Barkstone pass	15.44
105 36 $\frac{1}{2}$	Grantham arr.	4.21.42

* Distances are as given in new appendix to working-book

fine 7ft. 6in. single-wheeler with leading bogie, large boiler—having 1,269 sq. ft. of heating surface, 170lb. steam pressure, and a fire-box 7ft. long. The boiler centre stands as high as 8ft. 3in. above the level of the rails. As this engine is only just out of the Doncaster shops it is too soon for any of her performances to be on record, but if she prove as good as she looks the Great Northern Railway will have a valuable addition to its noble army of single wheelers.

That their ranks needed recruiting with reinforcements of greater power is very forcibly shown by some of my recent experiences with them on heavy trains. They failed to do what was demanded of them, but even in that failure were not disgraced, because the tasks imposed were manifest impossibilities with the limited tractive force which they possessed. For instance, one of the 7ft. 6in. single wheelers on the 7.45 p.m. "relief" express for the Highlands, which ran in the past summer up to August 12th, was timed to run from King's Cross to Peterborough (76 $\frac{1}{4}$ miles) in 85min., and another from thence to York (112 miles) in 126min. With moderate loads I have known them accomplish much more



THE LATEST DONCASTER PRODUCTION. MR. IVATT'S 7FT. 6IN. SINGLE EXPRESS ENGINE, WITH INSIDE CYLINDERS AND A LEADING BOGIE

It will thus be seen that No. 990 acquitted herself with marked credit, and Mr. Ivatt may fairly be congratulated on the high merit of her performances.

Mr. Ivatt's newest engine of all is a very

than this. But they were required now to take a load of 260 tons at that timing, and, of course, they could not do it. The first took 90min. 25sec. to Peterborough, losing 5min. 25sec.; the second, 139min. thence to York,

losing 13min. It was a matter of easy rudimentary calculation that they must and would lose at least as much time as this.

Yet those fine engines had in reality done excellent work. The one had averaged 50.5 miles an hour to Peterborough, the other 48.3 miles an hour from Peterborough to York, and that hauling a load of 260 tons although having only 92.5lb. of tractive force for every pound of effective steam pressure in the cylinders, and but 160lb. of boiler pressure. It was not the banks to Potters Bar and Stoke Box that proved the most formidable obstacles, as might have been expected, for the speed never went below 40 miles an hour to Potters Bar, and the 15¼ miles from Tallington to Stoke Summit were run in 22min. 14sec., or at an average speed of over 40 miles an hour. Bad starts from London and Peterborough respectively spoiled the runs. The engines took so long to get into speed that when they did attain it the time had been lost, and it could not be regained. Thus, notwithstanding that the engines performed work such as is never seen on some British railways, or on any European Continental railways outside France, they nevertheless could not do what had to be done. They did excellent work, much more

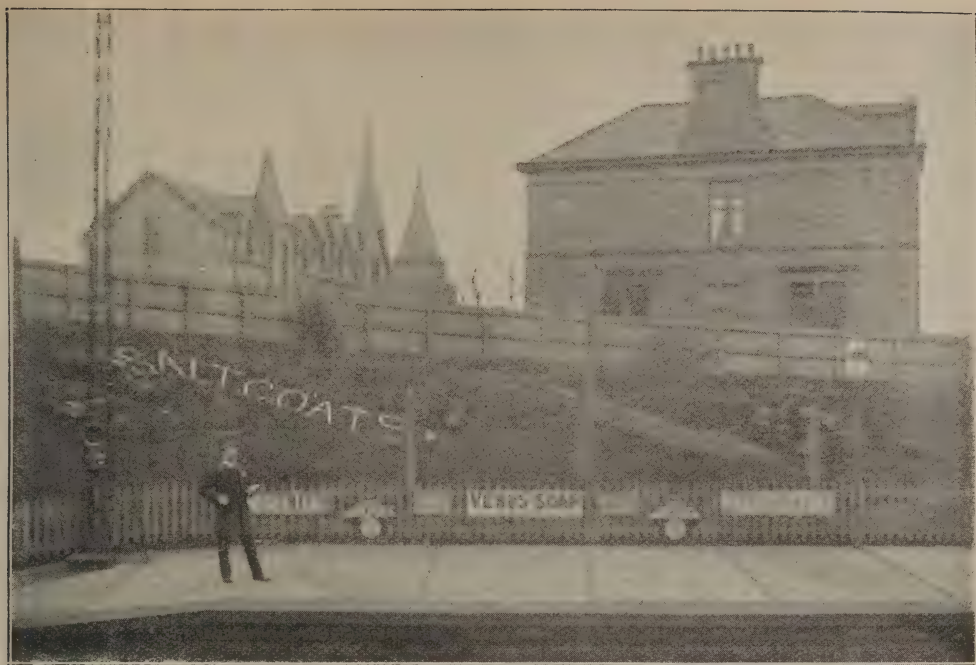
than they were designed to do, much more than they could be reasonably expected to do, but impossibilities they could not do. They could not take modern loads and yet keep time over that road at an average speed of 53.5 miles an hour. I could quote many other similar cases in point.

So here we have the origin and *raison d'être* of the new Great Northern engines. They have been called for by a pressing need as the sole alternative to excessive piloting or intolerable loss of time.

So far there seems every reason to believe that Mr. Ivatt's new locomotives will fulfil the task imposed upon them. In my experience of No. 990 she has always done so to entire satisfaction. Of the new single-wheeler, No. 266, and of the large 1321 coupled class it is as yet too soon to speak definitely, but unless their appearance greatly belie them we may hope for a revival by their means of the old traditions of the best Great Northern days—"one engine, one train," and time never lost in the running, whatever the load and speed.

All the photographs from which my illustrations are taken are by Mr. F. Moore, of 9, South Place, Finsbury, E.C.





A UNIQUELY DECORATED RAILWAY STATION

THE artistic temperament is by no means confined to professional or amateur "artists." The present stationmaster at Saltcoats, on the Glasgow and South Western Railway, possesses the instinct, and has developed it in a remarkable manner. Mr. Gilmour has occupied his position at Saltcoats since 1890, and each year he has composed some lines of rhyme, which, by means of cockle-shells, he exhibits on the banks at the back of the platforms. By reference to the above illustration it will be seen that one of the rhymes for 1898 was—

When like a *fish** that's oot the watter,
Come try a dook dull thochts to scatter.

* Represented by a picture of a fish in shells.

The other reads—

For pleasure sails and coaching tours,
"A 1" 's our reputation;
So to enjoy your leisure hours
Take train from Sou'-West station.

But the cunning of the Saltcoats stationmaster is not confined to rhyming only. By

reference to our other illustration it will be found that the station is also decorated with some clever pictorial representations (in cockle-shells) of the Ballochmyle Viaduct, with a Glasgow and South Western Railway train crossing same. Beneath the viaduct, also in white cockle-shells—as, indeed, are the whole of the decorations—are the arms of the Glasgow and South Western Railway Company. To the left of the Company's arms will be seen a representation of the railway's steamer "Glen Sannox" and Brodick Pier; whilst to the right one of the railway's four-horse char-à-bancs is depicted. The whole thus represents the Glasgow and South Western Railway's celebrated pleasure tours by train, coach, and steamer.

It will be noticed that the rhymes (in the ovals) to the right and left of the "Saltcoats" invariably refer to the advantages of the Glasgow and South Western Railway.

"One volunteer is better than three pressed men," and there can be little doubt that Mr. Gilmour's efforts on behalf of the Glasgow and

South Western Railway have met with greater notice than some of the other methods adopted to make known the railway.

We have previously stated that the cockle-shell style of decoration was adopted in 1890, the couplet for that year being—

Here you ought to build your nest,
And travel by the old Sou'-West.

The next year two mottoes appeared in the now famous cockle-shells—

Still patronise the old Sou'-West,
By 'doing so you'll find it best.

And—

Awa' frae smoke, the din, and clatter,
Try fresh air and oor saut watter.

In 1892, with the green grass still as a

The year 1893 found the artistic station-master still to the fore with the invitation—

All welcome back that were here before,
And bring your freens to oor famous shore.

The companion lines were a eulogy of the Glasgow and South Western Railway—

For speedy transit—rail and sea—
We'll take the lead where'er we be.

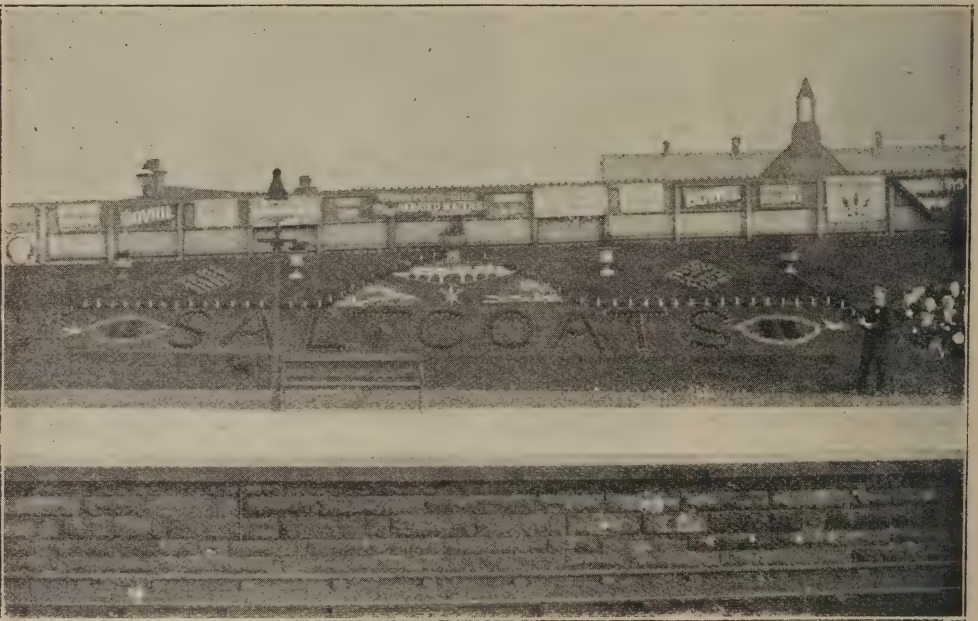
The next year's shell couplets were much in the same strain—

The old Sou'-West shall never fail
To keep the lead by sea and rail.

The opposite lines being—

Oor healthy toun and sandy shore
Hae something guid for you in store.

The Scottish newspapers from the first have regularly chronicled the annual decoration of Saltcoats railway station, and in 1895 the fame



background for the white shells, travellers could read on the bank of Saltcoats platform—

When speed and comfort you combine,
There's nothing like the Sou'-West line.

The companion rhyme reading—

Recruit your health, come out your *shell*!*
A month down here is sure to tell.

* Represented by a large shell

of Saltcoats' stationmaster and his handiwork had reached London, and the lines were reproduced in a Metropolitan periodical—

Change here for pure invigoration,
You'll find it no imagination.

And—

Railway to recruit,
Should anyone trouble you,
Label and book
Per the G. and S.W.

It will be observed that the modest couplet had now grown into a four-line stanza, and so we find it in 1896 and succeeding years. The cockle-shells, under Mr. Gilmour's directing hand, asked in 1896—

Why live as in a *shell** confined?
There's freedom here and health combined.

* Represented by a large shell.

Also—

Of a' the lines that e'er ye saw
Ye'll dearly lo'e Sou'-West,
In summer's sun or winter's snaw
Oor trains and boats are best.

In 1897 the pair of mottoes exhibited at Saltcoats Station in white cockle-shells read as follows—

Why not enjoy a holiday
By railway, road, or sea,
And listen to the echo,
"The old Sou'-West for me"?

The couplet being—

Come here a month, your health restore,
There's nothing beats our famous shore.

The two photographs we reproduce give as good a representation as it is possible to get in our limited space of Saltcoats Station in 1898, and Mr. Gilmour, the author of the lines and pictorial designs, is to be seen in the foreground of our illustrations. By the employment of his peculiar talent he has certainly made Saltcoats Station a veritable railway show-place in Scotland, and we are sure readers of the RAILWAY MAGAZINE will be pleased to find that Mr. Gilmour's clever work is sufficiently meritorious to find a place in our pages. We congratulate the Saltcoats stationmaster on the success he has achieved in the special line he has adopted, and trust each year will find him to the fore in the exercise of his original talent.





RAILWAY LITERATURE

"THE RAILWAY AND COMMERCIAL GAZETTEER OF ENGLAND, SCOTLAND AND WALES."

[London: McCorquodale and Co., Ltd.]

We have just received a copy of the fourteenth edition of this standard gazetteer, which is thoroughly down to date, whilst the lucid method adopted in the arrangement of the information given makes any reference a matter of extreme simplicity. The comprehensive character of the work can be gathered from the fact that the book contains a complete list (alphabetically arranged) of every railway station, town, village, hamlet, and place in Great Britain, showing the distance from London to each railway station, and the distance by road from the station to the place, together with the locality, line of railway, and nearest station, population (from last census). Particulars of post, telegraph, and money-order offices are also given, as well as through rates for passengers, goods, and parcels from and to London and all parts of the kingdom, shipping facilities, and other information. From the above readers will be able to judge

what an extremely useful work the "Railway and Commercial Gazetteer" is. The published price is 8s. 6d.

"DIRECT CALCULATOR: FOR COAL AND HEAVY TRADES."

[By M. B. Cotsworth. London: McCorquodale and Co., Ltd.]

We have been supplied with a copy of the new edition of this useful calculator. It shows at a glance to the nearest penny the values for all weights from 1qr. to 1,000 tons by penny gradations at all rates from 1d. to 25s. per ton. To prevent any chance of errors the calculations are mathematically proved on stereotyped plates, and so ensure permanent accuracy. One great advantage of the "Direct Calculator" is the duplicate index, which guides the reference direct from any opening to the page required without ever requiring the turning of a second page. Traders, railway freight clerks, and all others whose "time is money," will find the book invaluable. The published price, on stiff paper, is 2s. 6d., or if with cloth index for hard wear, 3s. 6d.





THE PHANTOM TRAIN

When the night is dark and stormy,
And the clouds are black o'erhead,
When the screech-birds cry in chorus,
As if mourning for the dead,
When the wild winds are roaring,
And the air is thick with rain.
Then on such a night, with a shriek of affright,
Is seen the Phantom Train.

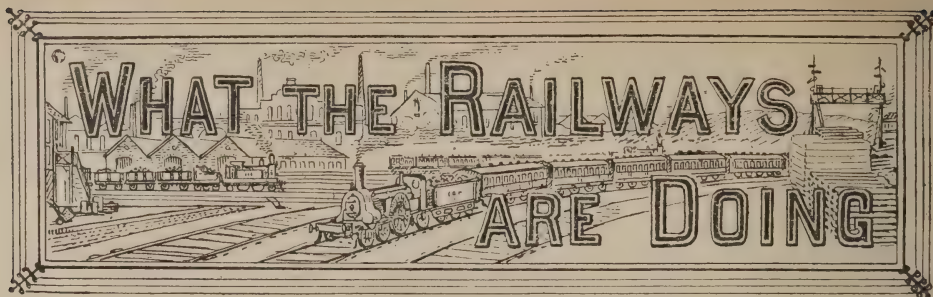
With a roar and a hiss the engine
Rushes on its phantom road,
With its ghostly phantom driver
And its grisly phantom load;
And the villagers in their terror
Cross themselves again and again—
But no one knows how the story goes
Of the fearsome Phantom Train.

There are whispers of a collision—
Of a driver who blasphemed the Lord,
And was doomed therefore in this manner
To suffer ever afterward.
But not one knows the story,
Tho' the gossips guess in vain—
Yet on stormy nights, with a shriek of fright,
Runs the terrible Phantom Train.

Now, who can solve the mystery
Of this Phantom Train of Fear,
And who can say where it comes from,
And why does it run each year,
With its headlights flashing brightly,
And who can ever explain
The skeleton crew, and the driver too,
Of the fearsome Phantom Train?

ALPHONSE COURLANDER.





CALEDONIAN.

THE new bogie brake vans recently introduced by Mr. McIntosh, Locomotive Superintendent, Caledonian Railway, are being much appreciated

by the guards. A guard who has been on the road for about thirty years states that they are most convenient and comfortable, and that they are a pleasure to travel in as compared with the six-wheelers, which subjected the guards to much rough jostling when working in the van while the train was running at a high rate of speed.

GREAT CENTRAL.

The Great Central Railway always has a "sensation" entirely its own, and on Dec. 9th, before Mr. Justice Romer, at the instance of the Ashton-under-Lyne Corporation, an injunction was applied for restraining the Great Central Railway Company from continuing to permit a nuisance by a fire on a piece of waste land on railway property near Ashton-under-Lyme. Mr. Lovett, Q.C., for the railway, said the fire had been burning for a year, and everything human ingenuity could think of had been tried to put the fire out, but without success. His Lordship directed an independent expert to report to him as to what steps ought to be taken to put the fire out, the motion to stand over until the report was made, and, in the event of the parties failing to agree upon the choice of an independent expert, a person was to be chosen by the President of the Institute of Civil Engineers.

GREAT EASTERN.

A collision occurred on the Great Eastern Railway on the afternoon of December 19th between Ilford and Manor Park. While a

local goods train was being shunted a truck left the metals, and a through goods train proceeding to London almost immediately afterwards collided with it. The engine and several trucks were thrown across the metals. The driver was the only person injured. The up and down main was blocked, the permanent way being considerably damaged.

GREAT NORTHERN.

The Great Northern Railway have obtained a very successful result in some artesian boring operations they have had carried out at Warrington, near Peterborough Station, by Messrs. Le Grand and Sutcliffe, of London. At a depth of 132ft. a spring has been struck, the flow of which is at the rate of 300,000 gallons per day.

In the early morning of Dec. 6th, an express goods train was running past Three Counties Station at 40 miles an hour when the trucks suddenly left the line, and a terrific crash announced to the officials that an accident had happened. The goods train consisted of about 20 trucks heavily loaded. On leaving the rails the goods trucks fell over upon the down main line. Fortunately the coupling broke, and the engine and four front trucks got away safely. The rest of the train was completely wrecked, strewing the line for at least a quarter of a mile. Breakdown gangs, each of thirty men, were sent from Peterborough, Hitchin, and King's Cross. Armed with powerful cranes, the gangs soon cleared away the wreckage. Relatively it was a very little thing that threw the train off the line—nothing more than a thick leather driving-band, with which it is supposed one of the trucks was loaded. This must either have fallen out of the train through oscillation, or been dropped upon the line by a goods train, which preceded the express. At any rate, the comparatively slight obstruction caused the accident by getting locked in the wheels, and so throwing the train

off the line. Fortunately no loss of life has to be recorded, but the rear guard was severely bruised.

GREAT NORTH OF SCOTLAND.

Mr. Moffat, the enterprising General Manager of this "Bigger and Better" railway, is still to the fore in providing new facilities for the patrons of the line which he so ably directs.

GREAT WESTERN.

The following are the details of the record run on Wednesday, December 7th, 1898, of the "special" from Paddington to Old Milford and back. The train consisted of two brake thirds, two first-class corridor coaches, and a dining-car, all the vehicles being modern eight-wheeled stock. Its weight was about 110 tons. The engines engaged were: From Paddington to Newport and back, No. 3,041, "The Queen," 7ft. 8in. single driving wheels, cylinders 19in. by 24in. From Newport to Milford and back, No. 817, four-wheels coupled, 6ft. 6in. diameter, cylinders 17½in. by 24in. The following is the time-table of the up and down journeys:—

Distance from Paddington.	FORWARD JOURNEY	Time.		RETURN JOURNEY.	Time.	
		Booked	Actual		Booked	Actual
Miles.		a.m.	a.m.		p.m.	p.m.
—	Paddington dep.	8 50	8 51	Old Milford dep.	5 50	6 4
77½	Swindon pass	10 15	10 15	Johnston arr.	6 0	6 14
106½	Bath " "	10 49	10 47	dep.	6 4	6 15
143½	Newport arr.	11 42	11 31	Landore dep.	7 32	7 39
—	dep.	11 47	11 36	" dep.	7 36	7 44
		p.m.		Cardiff pass	8 33	8 38
155½	Cardiff pass	12 31	11 53	Newport arr.	8 49	8 52
		p.m.		dep.	8 54	8 58
190½	Landore arr.	12 59	12 45	Bath pass	9 49	9 47
	dep.	1 4	12 51	Swindon " "	10 26	10 19
265½	Johnston arr.	2 35	2 16	Paddington arr.	11 50	11 35
	dep.	2 40	2 17			
269½	Old Milford arr.	2 50	2 25			

In addition to the booked slowings at Neath, Drawbridge Junction, and Haverford-west on both the forward and return journeys, signal and other causes necessitated additional loss of time as follows: Just before reaching Slough the brake had to be applied, a bull having strayed upon the line at a most inopportune moment. There was a brief stoppage east of Swindon. The relaying of Box Tunnel necessitated a cautious speed.

Mr. J. L. Wilkinson, the successful General Manager of the Great Western Railway Com-

pany, anticipates being able to reduce the journey by another forty minutes when the Chipping Sodbury line is opened.

From the commencement of the New Year the Great Western will carry on the passenger service upon the Pontypridd, Caerphilly, and Newport line, negotiations between the Company and the Alexandra Dock Company, the owners of the line, having been satisfactorily concluded.

A new station will be opened by the Great Western Railway Company next spring between Slough and Taplow, and will be designated "Burnham Beeches."

HIGHLAND.

Travellers over this system are already reaping benefits from improvements inaugurated by Mr. T. A. Wilson, the capable General Manager, whilst the opening of the new short route to Inverness has placed the Highland Railway in a very strong position with regard to through traffic to and from the far North. New locomotives and rolling stock are also greatly *en évidence* on the system.

LONDON AND NORTH WESTERN.

An event of considerable interest to the railway people who make Bangor their headquarters took place on Wednesday night, December 7th, when Lord Stalbridge (Chairman of the London and North Western Railway Company) and several prominent officers took part in the opening of the Railway Institute. The meeting was presided over by Mr. W. Dawson, District Engineer, London and North Western Railway, who has taken a foremost part in the establishment of the Institute, and has been elected its first president. The President referred to the generosity of the railway company in the matter. The directors had been kind enough to allow the use of the building at a nominal rental of one guinea a year. Lord Stalbridge, who was most cordially received, remarked upon the great pleasure it gave him to be present to assist at the launching of such an institution, which he fervently hoped would flourish for many years to come. He believed that such an institution would promote the mutual sympathy and co-operation which he would not say ought to exist, but did exist, between employers and employed. They all had one object in common, and he wished that sometimes the employees would feel more that they were members of

that great institution, the London and North Western Railway Company. In fact, he only wished it were possible that their employees should have a share in the Company, in order that they might feel that they were dealing with their own. He and his colleagues would continue to watch with interest the work of the institution.

Good progress is being made with the construction of the Ashbourne and Buxton section of the London and North Western Railway. Sites of the proposed stations have been selected, and building has been commenced.

LONDON, BRIGHTON AND SOUTH COAST.

A gentleman residing at Oakley, near Dorking, has been fined at Dorking the full maximum penalty of £5 and costs for using the electric communication of an express on the London, Brighton and South Coast Railway without reasonable cause. The defendant stopped the train when it was passing the station at which he wished to alight, and at which it was not timed to stop. When spoken to defendant's only excuse was that they stopped for other people, and they would have to do so for him. He also told the guard that it would be a bad job for him (the guard) if he reported the matter.

LONDON, CHATHAM AND DOVER.

The following are particulars of the running of the Royal special train conveying the Grand Duke and Grand Duchess Serge of Russia on November 12th, 1898:—

Time of departure from Dover Harbour	3. 8 p.m.
Time passing Chatham	3.55 p.m.
Time of arrival at Ludgate Junction to pick up South-Western pilot	4.35 p.m.
Distance from Dover	77 miles
Time of departure from Ludgate Junction	4.38 p.m.
Time of arrival at Windsor	5.10 p.m.
Total distance	99 miles, 21 chains
Weight of train, including engine and tender	152 tons
Driver	H. Tollervey.

The engine was "No. 15," built in the Company's Longhedge Works, Wandsworth Road, S.W.; cylinders, 18in. by 26in.; 6ft. 6in. coupled wheels; and leading bogie wheels, 3ft. 6in.

	Miles per hour.
Dover to Windsor in 122 min., average	48.68
Dover to Windsor, deducting 21 min. for stops	58.81
Dover to Wandsworth Road in 83 min.	54.93
Dover to Wandsworth Road, deducting 11 min. for stops, etc.	63.33

The average speed between Sole Street and Swanley, a distance of 9 miles 17 chains, was 69 miles per hour; this would mean about 75 miles over some parts of the road between these points.

For various reasons the speed of this special train had to be reduced at the following places, of which we give the estimated number of minutes lost:—

	Min lost.
Over Union Road Bridge 10 miles per hour (new girders)	2
Through Faversham Station 15 miles per hour (rebuilding station)	2
Between Teynham and Faversham (p.w. renewals)	1
Over Medway Bridge 10 miles per hour (repairs)	3
Over Rochester curves, 1 mile, 20 miles per hour (regulation speed)	3
Through Beckenham Junction	1
Through Herne Hill, 10 miles per hour (regulation speed)	1
Through Factory Junction, 20 miles per hour (regulation speed)	1
Stop at Ludgate Junction for examination of train, and to pick up L. and S.W.R. pilotman	3
Stop at Clapham Junction to pick up Mr. White, Supt. of Line, L. & S.W.R.	2
Almost came to dead stop at Isleworth signals, L. and S.W.R.	3
Twice checked at junctions on L. and S.W.R.	2

It will be observed that, in addition to the parts of the line on the London, Chatham and Dover system at which speed has always to be reduced according to regulations, at four other places speed had to be slackened owing to work in hand by Engineer's Department.

LONDON AND SOUTH WESTERN.

On the occasion recently of the distribution of prizes at the South Western Railway Institute at Eastleigh, Mr. Charles J. Owens, the General Manager of the Company, in an interesting speech, dwelt upon the importance of the instruction given in first aid to the injured by the St. John Ambulance Association, and urged all railwaymen to become members of the classes to be established throughout the

system. We learn that steps are being taken to encourage the highest qualifications in this respect among this Company's employees. In the case of a severed limb the necessity for immediate and efficient aid being rendered with the least possible delay is evident, and the object of inducing railwaymen to belong to such classes is one that cannot be too highly praised or encouraged.

A very attractive week-end trip has just been opened up by the issue of cheap return tickets to Havre from London and suburban stations, Portsmouth, and Southampton as follows: Every Friday, Saturday, and Monday, until further notice, cheap return tickets will be issued to Havre, from Waterloo—London (9.45 p.m.), Vauxhall (9.5 p.m.), Queen's Road (8.44 p.m.), Clapham Junction (9.12 p.m.), Kensington—Addison Road (8.50 p.m.), West Brompton (8.53 p.m.), Chelsea (8.55 p.m.), Wimbledon (9.6 p.m.), Surbiton (9.26 p.m.), Portsmouth (10.48 p.m.): Return fares—first class, 24s.; second class, 19s. Southampton (12.0 midnight): Return fare—first class, 20s.; second class, 17s. These cheap tickets will be available for return any week-day up to and including the Tuesday following the date of issue.

The L. & S.W.R. have spared no pains or expense to minimise the discomfort which to most travellers is inseparable from a sea trip by providing such steamers as the "Alma" and "Columbia" for the Havre service. The accommodation on board is admitted to be the most luxurious of any of the cross-Channel steamers, while their sea-going qualities and high speed have rightly earned for them loud praise. Being the old favourite and picturesque Normandy route to Paris, Honfleur, Trouville-Deauville, Caen, and Rouen, it is extensively patronised by Continental travellers, who we are sure will not be slow to avail themselves of the facilities now offered by the enterprising management of this Company.

MIDLAND.

The Midland Railway Company is now engaged in rebuilding its passenger rolling stock for the express trains, and a considerable number of new carriages have already been turned out of the shops. The vehicles are built on an improved pattern, and the interiors of the compartments are more roomy and comfortable than some other types of rolling stock.

The same Company has also increased the facilities afforded to winter tourist travel, tourist tickets being now issued to most of the inland and seaside watering-places in England and Wales during the winter months. The issue of cheap week-end tickets has also been extended to include Edinburgh, Glasgow, Greenock, Dundee, Perth, Aberdeen, and numerous other Scotch stations.

The rates for the conveyance of parcels by passenger train have undergone considerable revision for the benefit of the general public during the past year. The Midland Company has just issued a schedule, in book form, embodying the result of the general reduction of rates which has been made. Editions of the book are issued for London, Leicester, Nottingham, Bristol, Birmingham, Manchester, Liverpool, Sheffield, Leeds, Bradford, and other important towns, which show the new rates in force from the respective points. The reduced rates, so far as they relate to English towns, actually came into operation on May 1st, and to Scotland on July 1st, but a further alteration dates from December 1st, the minimum weight which formerly applied to the despatch of parcels at "owner's risk" being now abolished. In addition to a complete list of stations, the books contain other particulars relating to the conveyance of bicycles and other articles usually forwarded by passenger train, and copies may be had on application to any of the Midland Company's agents.

The new Midland Railway Goods Dépôt at Somers Town is now in complete working order.

NORTH BRITISH.

It costs the North British Railway Company £5,000 per annum for the working expenses of Cowlaers Tunnel, nearly £1,000 of which is expended on the rope.

NORTH EASTERN.

On Wednesday, December 14th, there was opened for passenger traffic the North Sunderland Railway—a light railway from the main line of the North Eastern Railway at Chathill to Seahouses, on the Northumbrian coast. The new railway had its first sod cut on May 16th, 1896, and it was opened for goods traffic in August last year. It is a single line of the standard gauge, and is a little over four miles in length.

RHYMNEY.

Mr. John Boyle, Chairman of the Rhymney Railway since it was first opened in 1858, has just retired in his 80th year. He is succeeded by Mr. Wm. Austin, who has been Deputy-Chairman since 1880. Mr. Franklen George Evans has been appointed Deputy-Chairman, and Mr. William Vachell has been elected to the vacant seat on the board.

SOUTH EASTERN AND CHATHAM AND DOVER.

From January 1st, and on every day (Sundays included), an express train will leave Victoria (London, Chatham and Dover Railway) at 10.30 a.m., running viâ Swanley and joining the South Eastern system at Sevenoaks, arriving at Tunbridge Wells at 11.30 a.m., St. Leonards at 12.10 p.m., and Hastings at 12.13 p.m. There will be a return train, by the same route, leaving Hastings at 4.55 p.m., St. Leonards at 4.58 p.m., and Tunbridge Wells at 5.41 p.m., arriving at Victoria at 6.45 p.m.

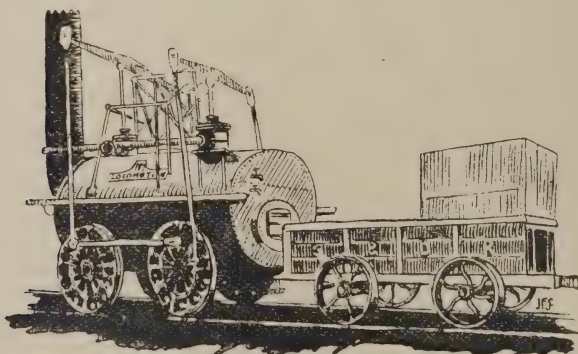
New Brompton, the rising suburb of Chatham, is also to derive benefit from the new arrangement between the Companies, as three or four of the more important trains will run from Charing Cross and Cannon Street to New Brompton (London, Chatham and Dover) Station, and *vice versâ*.

A new service has also been arranged viâ the Strood Loop, as suggested in the RAILWAY MAGAZINE for December, to the Continent viâ Flushing and Queenboro', leaving Charing Cross at 8.22 p.m., and London Bridge at 8.28 p.m., joining the Chatham and Dover mail train at Chatham.

The train service between Maidstone and London will also be greatly improved, as a loop line at Otford will be again opened, thereby accelerating the service between London and Maidstone by the Chatham and Dover system by as much as fifteen minutes in the case of certain trains. This was also suggested in the RAILWAY MAGAZINE last month. These improvements will also apply to all stations below Maidstone, and it has been arranged for the trains of the Chatham and Dover Company to run from Maidstone, viâ Ashford (South Eastern Railway), to Appledore and Hastings.

Chatham and Dover trains will no longer terminate at the Bat and Ball Station, Sevenoaks, but will run through to the much more convenient station of Tub's Hill, Sevenoaks.

These are some of the alterations which are notified as taking effect from January 1st, and it will thus be seen that the arrangement between the Companies for the working of the joint traffic is now taking definite shape, and will certainly be to the advantage of the public using these two railways.





N. D. Phillips

THE RAILWAY MAGAZINE

FEBRUARY, 1899

ILLUSTRATED INTERVIEWS

No. 20—MR. WILLIAM DOUGLAS PHILLIPPS

General Manager, North Staffordshire Railway



HAVE come, Mr. Phillipps, to ask for some information for the RAILWAY MAGAZINE concerning the North Staffordshire Railway—a subject, I need not add, of very considerable interest to my readers.”

“I have been much surprised at the numbers who read your Magazine and the intelligent interest taken in railway matters by the travelling public, but I fear the North Staffordshire Railway is a very steady-going concern, which does not go in for anything sensational likely to interest your readers.”

“Oh, I am sure there is plenty to interest them. The North Staffordshire Railway occupies a very important position in and around the district indicated by its title; perhaps, as a commencement, you will locate the district which the North Staffordshire Railway serves?”

“It is rather like an octopus, with its body at Stoke-on-Trent, stretching out its tentacles in every direction—northward to Macclesfield, where it joins the London and North

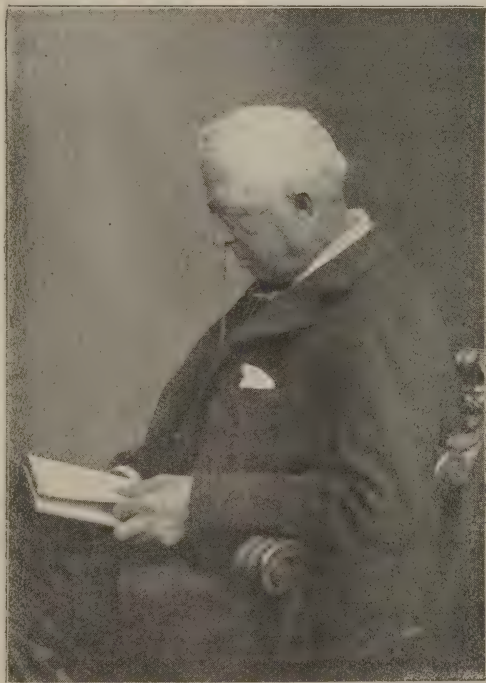
Western and Great Central Railways; north-west to Sandbach and Crewe, where again it joins the London and North Western; westward to Market Drayton, where it joins the Great Western Railway; southward to Norton Bridge and Colwich, where again it joins the London and North Western; south-east to

Burton and Derby, where it joins the Midland and Great Northern—204 miles in all, the longest run, from Crewe to Derby, being only 51. Most of our runs are so short that the drivers are afraid to put on much speed for fear of running 20 or 30 miles on to somebody else's line before they can stop!”

“Thank you; that, at any rate, speaks well as to the capabilities of the North Staffordshire locomotives! I assume that long previous to 1846, when the three lines—afterwards forming the original North Staffordshire Railway—were incorporated,

many railways had been projected through the district?”

“Yes; the old Birmingham and Manchester line should have run through the district, but



MR. THOMAS SALT
Chairman, North Staffordshire Railway

there was so much local opposition, especially from Newcastle-under-Lyme, that that route was abandoned."

"Having thus cleared the ground of preliminaries, I should like, Mr. Phillipps, a short account of the projection and construction of the railway. Mr. G. P. Bidder, the noted railway engineer, laid out and superintended the construction of the line, did he not?"

"Yes; and Sir George Findlay, late General Manager of the London and North Western, has many a time told me that he worked as a mason on the construction of the Harecastle Tunnel."

"That is certainly an interesting bit about the late Sir George Findlay. I notice Mr. Bidder, in his report of July 15th, 1848, states 'that no railway of the same length (viz., 128 miles), with works of such magnitude, with so efficient a carrying stock, stations, and equipments, has ever been completed at a less cost, and I am satisfied that it admits of being as economically worked as it has been economically constructed.' The North Staffordshire Railway has, I believe, always been noted for the efficient and economical way in which it is worked?"

"Bidder was a very able man, and according to the lights of those days the line was well laid out—that is to say, it was kept as nearly on the level as possible—and to accomplish this was run through the flattest part of the country, without any particular reference to the position of the towns it was intended to serve. This necessitated the construction of numerous short branches to accommodate the

towns, as in after years they became dissatisfied at being a mile or two away from the nearest station, and the working of the numerous branches adds very materially to the cost and complexity of the working of the line. The number of passenger trains in and out of Stoke Station between 5 a.m. and 11 p.m. is about 245 each day."

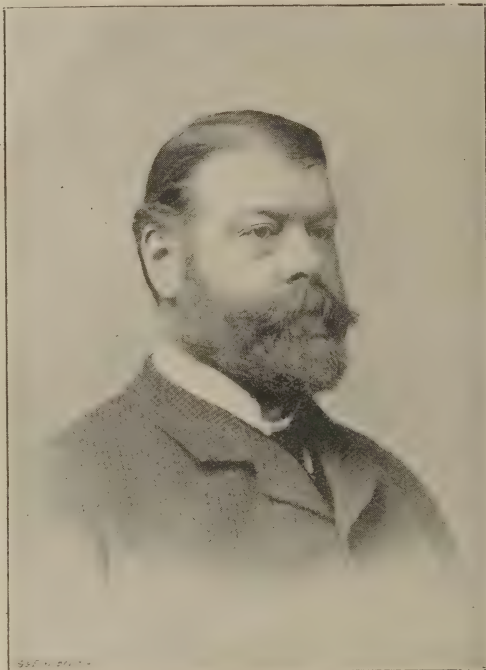
"Was not the North Staffordshire Railway originally and for many years worked by a contractor?"

"Yes, and the working was a reproach and bye-word throughout the country. It even got into 'Punch,' and 'Punch's' cartoon of 1850 is to this day displayed framed and glazed in the board-room at Stoke as a warning."

"I observe that in 1852 the question of amalgamation with the London and North Western Railway was submitted to the arbitration of Mr. Robert Stephenson and Mr. J. R. Hope, who reported in favour of the fusion of the Companies. Parliamentary sanction, after three successive applications, was re-

fused, and long legal proceedings with the London and North Western Railway resulted?"

"Yes, but nothing came of it, owing largely to the Midland and Great Western Companies objecting to such a valuable feeding ground for traffic falling into the hands of the London and North Western Company, but in 1867 an Act was passed giving the London and North Western Company running powers over all present and future lines of the North Staffordshire Railway, and to the North Staffordshire Railway running powers over the London and North Western Company's lines into Birming-



MR. FRANCIS STANIER
Deputy-Chairman, North Staffordshire Railway

MR. G. J. CROSBIE-DAWSON, C.E., F.G.S.
Chief Engineer

MR. R. E. PEARCE
Secretary

MR. LUKE LONGOTTOM, M.Inst.M.E.
Locomotive and Carriage and Wagon Superintendent

OFFICERS OF THE NORTH STAFFORDSHIRE RAILWAY.



MR. T. TRIM
Outdoor Assistant

MR. J. H. RICE
Assistant
General Manager

MR. E. B. SMITH
Canal Engineer

MR. G. H. STRINGER
Chief Cashier

MR. J. NEALE, C.E.
Telegraph Engineer

MR. J. FRED A. JONES
Accountant

ham, Liverpool, and Manchester, and mutual traffic facilities which, whilst preserving the rights of other companies, gave the North Staffordshire travelling public the benefit of services of through fast trains in every direction. Some of the most heavily loaded and fastest of the London and North Western Company's Manchester and London expresses run by way of Macclesfield and Stoke; in fact, our relations with that Company have for many years been most intimate and cordial."

"I believe North Stafford engines actually haul some of the London and North Western Railway Company's Manchester expresses of which you speak?"

"It may interest your readers to know that the London and North Western Railway's 12 noon express from Manchester to London is hauled from Manchester to Stoke by a North Staffordshire Railway engine. The load averages seventeen London and North Western six-wheeled coaches, and considering that the line is uphill all the way to Macclesfield, with a good length of 1 in 102 up across Macclesfield Moss, together with several short but steeper bits, the run is a very creditable one. The following is the official working of the train:—

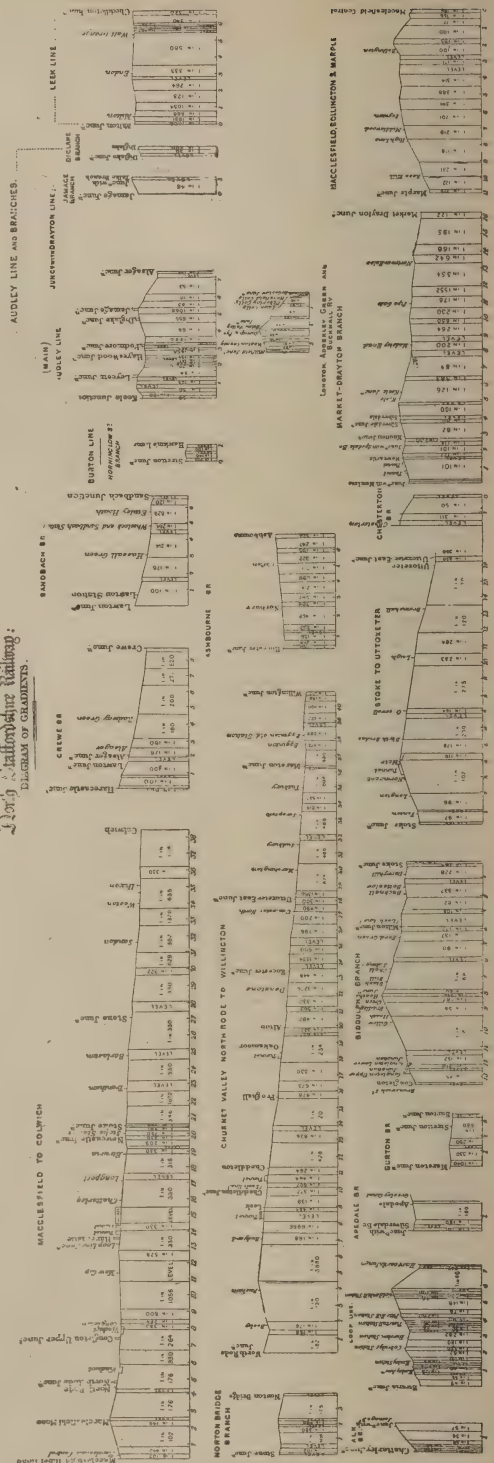
Miles from
Manchester

—	Manchester (depart)	12. 0 noon
5 $\frac{3}{4}$	Stockport (depart)	12.13 p.m.
17 $\frac{1}{2}$	Macclesfield, H. Road (depart)	12.35 "
20	Moss Cabin (pass)	12.39 "
22 $\frac{1}{2}$	North Rode (pass)	12.42 "
25 $\frac{3}{4}$	Congleton (pass)	12.46 "
29	Mow Cop (pass)	12.50 "
31 $\frac{1}{2}$	Harecastle (pass)	12.54 "
33 $\frac{1}{4}$	Chatterley (pass)	12.57 "
34 $\frac{3}{4}$	Longport (pass)	12.59 "
36 $\frac{1}{2}$	Etruria (pass)	1. 1 "
37 $\frac{1}{2}$	Stoke (arrive)	1. 5 "

The engine which hauls the train from Manchester to Stoke leaves the latter station at 1.17 p.m. for Birmingham with a section of the train (divided at Stoke). Another fair run during the summer is from Derby to Chester, with through Midland and Great Northern coaches for North Wales."

"Thank you, Mr. Phillipps. The North Staffordshire Railway has also intimate rela-

North Staffordshire Railway:
DIAGRAM OF GRADIENTS.



tions with the Great Western, Midland, Great Northern, and Great Central Railways, I believe?"

"Oh, yes; this is a busy manufacturing district, with room for all, and 'Let them all come' was my motto years before the comic song was heard."

"I notice in December, 1874, a resolution was adopted that it was desirable to negotiate for a sale or lease of the railway to some of

"As to your traffic, Mr. Phillipps. It is, I think, largely mineral and merchandise? Will you give me some particulars of any traffic for which your railway is particularly noted?"

"Our coal and coke traffic, which by rail is about $1\frac{1}{4}$ million tons and by canal about 120,000 tons a year, is, of course, by far the most important item; but earthenware and china, say 110,000 tons by rail and 50,000 to 55,000 tons by canal, is a big item (value



THE NORTH STAFFORD HOTEL, STOKE-ON-TRENT; THE PROPERTY OF THE NORTH STAFFORDSHIRE RAILWAY

the neighbouring railways. Such a proposal would not, of course, be entertained now?"

"The North Staffordshire Railway was at a very low ebb in 1874. In order to squeeze a dividend of $3\frac{1}{2}$ per cent. in 1871 and 1872 the expenditure had been starved, and when in 1874 the reaction came, and working expenses rose from 47 per cent. to 57 and dividends fell from $3\frac{1}{2}$ per cent. to $1\frac{1}{2}$, the shareholders were naturally dissatisfied, but that feeling has, I hope, long since passed away."

probably over £3,500,000); as is also clay and flints for making the said china, say 25,000 tons by rail and 120,000 by canal. Beer from Burton amounting to over 225,000,000 gallons a year also passes over our line."

"Then as to passenger traffic. Do you specially cater for tourist or holiday traffic on the North Staffordshire Railway?"

"As to passengers, we carry comparatively few, say $7\frac{1}{2}$ to 8 millions a year, but the number increases yearly as the picturesque district

through which our Churnet and Ashbourne lines run gets better known by tourists and holiday-makers."

interest. Recently the standard colour of the latter has been changed?"

"Yes; we have recently altered the colour



"Some details concerning your locomotives (which cannot attain full speed on your system because of the shortness of your main line, you remember) and rolling stock would be of great

of our coaches. They are now painted a bright lake colour, and very smart they look when first turned out, but the atmosphere of the 'Potteries' is very hard on paint and var-

nish, and soon dims their splendour. We find tank engines most useful for our short runs and heavy gradients both for passenger and goods work, and in order to carry more coke and water we are lengthening the frames, putting eight wheels under them instead of six. Passenger engines of this class have 17in. cylinders and 24in. stroke, and goods engines 18in. cylinders and 24in. stroke, the former having four coupled driving-wheels

length is 1,255ft.; and that over the Dane-in-Shaw, at Congleton, which has ten arches in brickwork, each 50ft. span. The greatest height of this viaduct above the ground is 111ft. There are 13 tunnels on the North Staffordshire Railway, that at Harecastle being more than one mile in length. There are no less than three tunnels running parallel to each other under the Harecastle Hill. The first was built about 1770 for the Trent and



EXTERIOR OF STOKE STATION, THE HEADQUARTERS OF THE NORTH STAFFORDSHIRE RAILWAY

5ft. diameter, and the latter six coupled driving-wheels 4ft. 6in. diameter."

"What are the principal engineering works that have been constructed in building the North Staffordshire Railway?"

"There are several handsome viaducts on the North Staffordshire Railway. The two longest are as follows: That over the River Dane at North Rode, which has 20 arches in brickwork, each 50ft. span. The greatest height of this viaduct above the ground is 105ft., and the

Mersey Canal, and is only 8ft. 6in. in width and 5ft. 10in. above the water line. The boats are worked through this tunnel by what is called 'legging'—that is, the boatmen lie on their backs on the boats and push against the roof or side of the tunnel with their feet, so that the boats are propelled in a direction opposite to the push. The second tunnel was built about 1825 for boats going towards the River Mersey. There is a towing-path in this one, and the boats are towed through in the

ordinary way. The third tunnel, through which the railway runs, is about seven yards above the level of these other two tunnels. It was constructed in 1848. The tunnel at Goldenhill, on the loop line, is 37ft. in width, being for three lines of rails. During the last dozen years nearly the whole of the permanent way has been relaid with steel rails. The rails now being laid down weigh 90lb. to the

Road, Hanley, Little Stoke, and Cheddleton Junction."*

"You operate a considerable mileage of canals; some particulars of this branch of the undertaking would be of interest, Mr. Phillips."

"Yes. We are owners of the 'Navigation from the Trent to the Mersey'—119 miles of canal, made by Brindley in 1766. In order to



INTERIOR OF STOKE STATION, NORTH STAFFORDSHIRE RAILWAY

yard, and the chairs weigh 50lb. each. During the last seven years upwards of sixty of the old timber or cast-iron girder bridges have been reconstructed in wrought-iron. A new roof was erected over Stoke Station in 1894, in one span of 85ft., to replace the original old roof in three spans. New stations have recently been opened at The Meir, Rolleston, Stockton Brook, Fenton Manor, Alsager Road, Lawton, and Wheelock; and new stations are in course of construction at Waterloo

buy off the strong local opposition the projectors of the North Staffordshire Railway had to purchase the canal by giving 5 per cent. preference stock for nine times the amount of their capital, or 45 per cent. per annum interest. Probably it was necessary to do this, as Parliament was in those days very tender to vested interests, and the Canal Company was at that time paying dividends

* We here in an early number to give illustrations of some of the stations and important works on this railway.—ED.

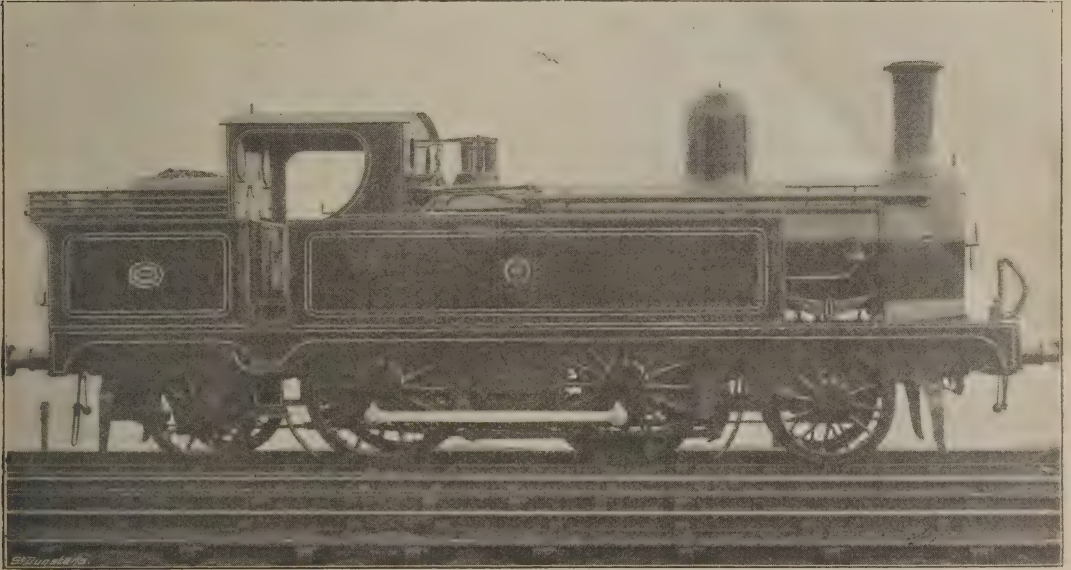
of 35 to 40 per cent. per annum. The bargain would not have been a very bad one had not the Canal Company got a clause inserted in the Railway Act cutting down the canal tolls, and consequently the revenue, to exactly one-half of what they were. There is still a very heavy mineral traffic on some parts of the canal."

"I see, by your Parliamentary notice, you propose to further extend the railway?"

"We are daily expecting from the Board of

have your views on this recent decision, Mr. Phillipps?"

"Yes. In 1846, when the Act containing this clause was passed, block telegraph working was quite unknown, whilst signals were things more talked about than acted upon in railway working, and platforms at stations were not contemplated, so that this restriction in speed was in the interests of the safety of the public; its effect is now simply mischievous; but the Warwick County Council could



THE LATEST TYPE OF NORTH STAFFORDSHIRE RAILWAY LOCOMOTIVE: A "DOUBLE-END TANK" ENGINE
Coupled Wheels, 5ft. diameter; Cylinders, 17in. diameter, 24in. stroke

Trade an order under the Light Railways Act authorising the construction of a short mineral railway from Leek to the limestone quarries at Caldon Low, and from the termination of this line an independent company will construct a 2ft. 6in. gauge line to Hartington, passing through most romantic scenery. We are also in Parliament next Session for a short line from Norton Bridge, through Eccleshall, to Gnosall, a useful piece of line some eight miles in length."

"I notice you seek to have the absurd restriction that limits to four miles per hour the speed of all trains crossing a turnpike road adjoining a station repealed. I should like to

not get a bridge built, and dug up this old Act in order to be as 'nasty' as they could.

"Now we are discussing questions of railway policy, perhaps you will be good enough to express your opinion on the subject of automatic couplers and other matters now before railway managers?"

"The great need for automatic couplings has passed away; now that all railway companies and most private wagon owners have discarded the old D link and hook and adopted Gedge's patent, a man with a pole, walking by the side of the wagons, couples and uncouples in a few seconds without risk or difficulty."

"Some statistics showing the progress of the North Staffordshire Railway will, I am sure, be of interest."

"We have men of conspicuous financial ability on our board. Our chairman for many

cent. and 4 per cent. respectively; in 1881 the ordinary stock stood at 75—78; in 1898 at 125—128."

"Now, Mr. Phillipps, I should like an account of your own career."



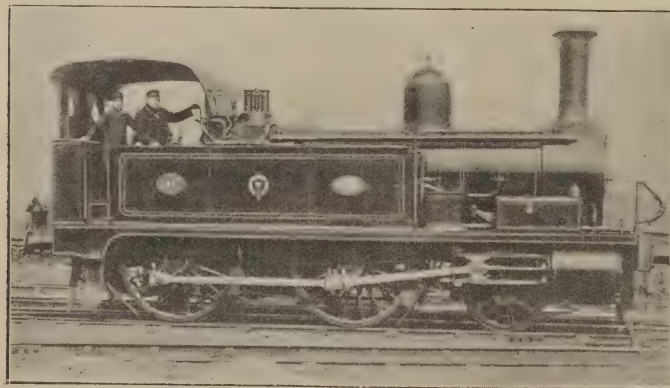
MAIN LINE PASSENGER ENGINE, NORTH STAFFORDSHIRE RAILWAY

Cylinders, 17in. diameter by 24in. stroke; coupled wheels, 6ft. diameter

years was Chairman of Lloyds Bank, and Mr. Spencer Phillips is the present chairman of that concern. Owing to the wise conservative policy which the directors have adopted, which has done so much to consolidate and improve the position of the Company, the increase in the capital has been very moderate, viz., from £8,000,000 to £10,400,000 in the last fifteen years. The gross revenue for six months ending June 30th, 1881, was £314,872; for the same period of 1898, £417,916; the moneys paid in dividends for the same periods being £97,500 and £137,800 at the rate of 2 per

"I was brought up as a mechanical engineer, being articled to Scott Russell, and was with him during the time he was building the 'Great Eastern' steamship at Millwall, but before I was one and twenty I was appointed manager of a little mineral railway in South Wales, 26 miles in length. This line was in 1871 (it was then 77 miles) bought up by the Great Western and London and North Western Railway Companies, and I became District Manager for the London and North Western Company. Before long I was sent to Manchester in charge of their North-Eastern

District, and early in 1882 obtained my present appointment. Although I am still only in the fifties, I believe I am about the oldest member of the Clearing House Goods Managers' Conference still on active service, my first appearance in that capacity being in January, 1866. Railway working in South Wales was very primitive in my early days. A brake-van behind a mineral train was unheard of; the brakeman used to ride on the buffers of the last wagon.



A HANDY CLASS OF FIVE OUTSIDE CYLINDER TANK ENGINES,
Built by Sharp, Stewart and Co. in 1874 to work the Half-hourly Service
between Stoke and Hanley, via the Loop

Where the gradients were steep he used to be assisted by one or two 'bank-riders,' who ran along the tops of the coal trucks, putting down and picking up the brakes as required. On the South Wales section of the Great Western Railway, then an independent line, but worked by the Great Western Railway, the practice of the guards of passenger trains riding outside the carriages had just been discontinued, but the seats they used to occupy at the ends of the carriages still remained. The passengers' luggage, however, was still carried on the roofs of the carriages, the tarpaulins and straps that secured it being part of the fittings of every composite carriage. This luggage was in charge of the 'train

passed through their station without stopping they stood at 'attention,' with their signal-flags at the 'shoulder,' in a conspicuous position on the platform. The guard was the man responsible for the working of the train. Passenger trains had the 'right of road,' the guard of a goods train being responsible for his train being shunted clear fifteen minutes before a passenger train was due, or, failing that, he must protect it by going back with his flags and hand-lamp. Fog-signals were not used, but at night a 'port-fire' was put down in the 'four-foot' and lighted. It was a red Bengal light, which burned for about fifteen minutes. As to the permanent-way, the 56lb. rails, laid in cast-iron chairs on stone blocks, were being



EXTERIOR OF STOKE STATION, NORTH STAFFORDSHIRE RAILWAY, IN 1848

porter,' who used to ride in a sort of iron sentry-box at the rear end of the tender, where he could see that the luggage travelled safely. Block working and the interlocking of points and signals had then scarcely been dreamed of; the point and signal levers were not concentrated into signal-cabins, but were worked by 'running pointsmen.' At stations there were 'police constables,' one of whose many duties it was to protect a train when standing at their station by putting the signals to danger behind it, pulling them off again as soon as the train had started on its journey (the normal position of signals was 'Line clear'). It was the proud privilege of these men to wear tall hats, and when an express train

removed to make way for flat-bottomed rails, laid on sleepers without chairs; and the 'Barlow' rail, which was laid on the ballast without either stone block or sleeper under it, was being replaced by the 'bridge' rail, laid on longitudinal baulks of timber. Accidents? Oh, yes, there were certainly accidents, but they were not so numerous as might have been expected, and, owing to slow speed of trains, were seldom serious."

"Thank you; it is most interesting. Perhaps you will supply me with a few details relative to your chief officers?"

"Our chief officers are an able and energetic set of men. Mr. R. E. Pearce, the Secretary, has spent all his railway life at Stoke,

and has the business of his department at his finger ends. In 1891 he succeeded his father as Registrar and Assistant Secretary, and in 1894 was appointed Secretary on the death of Mr. Percy Morris. Mr. Wharton, from the Great Central Railway, is his Registrar. Mr. G. J. Crosbie-Dawson, C.E., F.G.S., came to us in 1886 from the Lancashire and Yorkshire Railway, where he had been Chief Assistant Engineer. Prior to that he had been Resident Engineer on the London and North Western

lines. When the latter was swallowed up by the London and North Western Company in 1863 he went over to them, and was in charge of their Locomotive Depôt at Preston when he came to us. Mr. J. F. A. Jones, our Accountant, came to us from the Clearing House two and a half years ago only, but Mr. G. H. Stringer, our Chief Cashier, has been with us for forty years, for sixteen of which he was Assistant Accountant, and for the last five years he has occupied his present position.



SCENE AT THE OPENING OF THE NORTH RODE VIADUCT OVER THE RIVER DANE,
NORTH STAFFORDSHIRE RAILWAY

Railway, and under his supervision many of their branch lines had been constructed, and the widening of their main line between Rugby and Nuneaton, Stafford and Crewe, and Euxton and Preston, including the big viaduct over the Ribble and the new stations at Preston and Birmingham. Mr. L. Longbottom has been our Locomotive and Carriage and Wagon Superintendent since 1882. He was Locomotive Superintendent of the *little* North Western* and Kendal and Windermere

I am also ably supported by Mr. J. H. Rice, my Chief Assistant, who first joined the service in 1852; Mr. T. Trim, Outdoor Assistant; Mr. T. H. Machin, Chief Rates Clerk; and Mr. S. Barker, Chief Coaching Clerk. Our canals are under Mr. E. B. Smith, C.E., as Engineer, who joined the Company in 1886. Prior to that he was Engineer of the Huddersfield Canal. Mr. J. F. Green, our Storekeeper, is also a very old servant, and has occupied his present position for the last ten years. Mr. John Neale, our Telegraph Engineer and Superintendent, was formerly in the service of the Electric Telegraph Company, and joined the North Staffordshire Railway Company

* The North Western Railway was a line from Skipton to Kendal, and is now amalgamated with the Midland; it was an entirely different railway to the London and North Western Railway.—ED.

thirty-five years ago. He gives me the following most interesting information:—

“The telegraphs on this railway were commenced in 1848 by the old Electric Telegraph Company, and were gradually extended up to the year 1855, when they consisted of six double needle circuits, working from the termini of the several branches into Stoke Station, the centre; and a short double needle circuit for working the traffic through Harecastle Tunnel. In those days the messages transmitted were few, and were copied in full into a book for reference. This message record book shows that on Tuesday, June 21st, 1853, seven messages and about a dozen train reports passed through the Stoke office, and this was an average day's work then.”

“That is rather different, Mr. Phillipps, to a day's work at the present time?”

“Certainly. At the present time nearly 5,000 messages per day pass through the same station, not including conversational messages sent by telephones.”

“Mr. Neale must have seen many changes and improvements in signalling and block working on the North Staffordshire Railway?”

“Yes; he has been responsible for much that has been inaugurated in those directions. Until the year 1864 trains were run upon the lines with an interval of time between. In that year the whole of the lines were fitted for working with the block system. In addition to this, signal-boxes and stations are put in communication with each other by telephones; dangerous level crossings are protected by gate bells and treadles, by which warning is given to persons crossing the line. The signal lights and signals are repeated by

electricity to the men working them in the signal-boxes.”

“I notice, Mr. Phillipps, that electric lighting has been introduced at Stoke Station to some purpose; the fitful glare and deep shadows one often meets with are absent?”

“In the year 1893 the Company commenced electric light installations, and Stoke at present is credited with being the best-lighted platform existing. In the daytime the electric power is used for driving machinery in the engineering shops by means of motors, and for working an electrical crane for loading and unloading goods.”

“Before closing this pleasant and most instructive interview, have you any other information you would like to give me, Mr. Phillipps?”

“Water is electrically boiled in the refreshment-rooms, which, I believe, is a novelty you will not find elsewhere on a British railway. The offices also are warmed with electric radiators. I am sure you will find that we have quite kept pace with the progress which electrical science has made in the last few years, and the North Staffordshire Railway claims to be as well equipped with all electrical appliances as any railway. We are amongst the largest quarry owners in the kingdom, and our Froghall Quarries turn out over a quarter of a million tons of stone.”

“Thank you very much for the great trouble you have taken to answer my questions. I am sure that, as a result, the interest of RAILWAY MAGAZINE readers in your own career and that of the North Staffordshire Railway will have received a lasting stimulus.”



THE FIRST LOCOMOTIVE OF THE GREAT CENTRAL RAILWAY



S the opening of the Great Central Railway's extension to London is about to take place, anything relating to the genesis of this important line will be of great interest to our readers. We

therefore have pleasure in giving an account of the first engine constructed for the Sheffield, Ashton-under-Lyne and Manchester Railway—the Company from which the Great Central has developed.

An Act of incorporation was obtained in 1837 by the Sheffield, Ashton-under-Lyne and Manchester Railway for the construction of a line, 40 miles in length, from Spitalfields, Sheffield, to the Manchester and Birmingham Railway at Manchester. It was on this line that the celebrated Woodhead Tunnel, 5,297 yards in length, had to be constructed—at first for a single line, the width being 16 feet. Having thus introduced the subject, we will return to locomotive No. 1 of the Sheffield, Ashton-under-Lyne and Manchester Railway.

It is interesting to learn that a portion of this historical engine is preserved at Gorton Works through the generosity of Mr. H. Pollitt, the Locomotive Superintendent. Mr. I. W. Boulton, who probably knows as much as any living person about early loco-

motives, supplies the following interesting particulars concerning the romantic career of this engine:—

“In 1842 I was working at Newton Station, the then locomotive depôt of the Sheffield, Ashton-under-Lyne and Manchester Railway. They had then three locomotives, with 13in. cylinders and 65lb. per sq. in. boiler pressure.

These engines came new from Messrs. Kirtley, of Warrington, early in November, 1841, and the line was opened from Travis Street, Manchester, to Godley Green, near Hyde, about November 20th, 1841.

“They could at that time only afford a single line of rails from end to end, with a meeting place at Guide Bridge. At that time, and for some time after, there was no Ardwick Station nor Ashburys. In the latter part of 1842 No. 1 locomotive broke her fire-door ring, and it was considered at the time a considerable feat to put in a new ring without taking the

fire-box out. Readers will see, on referring to the photographs, what the plate was like. I helped to do the job. It is not often one can look back at work which one helped to do over fifty-six years ago.

“This No. 1 ultimately was sold, and went out to Spain to make a new line there, and Mr. Gee also went there. One day this same



FIRE-BOX OF NO. 1 LOCOMOTIVE OF THE SHEFFIELD, ASHTON-UNDER-LYNE AND MANCHESTER R.WY.

Showing new Fire-door Ring, fitted by
Mr. I. W. Boulton in 1842

locomotive ran off the road in Spain and fell over on to Mr. Gee and killed him. He was one of the early engineers on the Sheffield, Ashton-under-Lyne and Manchester Railway. This locomotive came back to England, and

stored the plate until recently. I have always thought the proper place for it was in some safe corner at Gorton, which has for so long been the chief depôt of the Sheffield, Ashton-under-Lyne and Manchester Railway (now the



THE CONDITION OF THE FIRE-BOX PLATE OF No. 1 LOCOMOTIVE OF THE SHEFFIELD, ASHTON-UNDER-LYNE AND MANCHESTER R.W.Y. IN 1894

With Portrait of Mr. Isaac Watt Boulton

worked in Wales in connection with a colliery. About thirty years ago I met with her standing at Chester, and bought her and brought her to Ashton, where I broke her up.

"I could not but cling to the old plate or relic which I had known so long, and have

Great Central Railway), so I called upon Mr. H. Pollitt, the Locomotive Superintendent, and he gladly purchased the plate, and has it mounted on a suitable wood pedestal and placed on view in a convenient corner for posterity to look at."



THE WISBECH AND UPWELL TRAMWAY

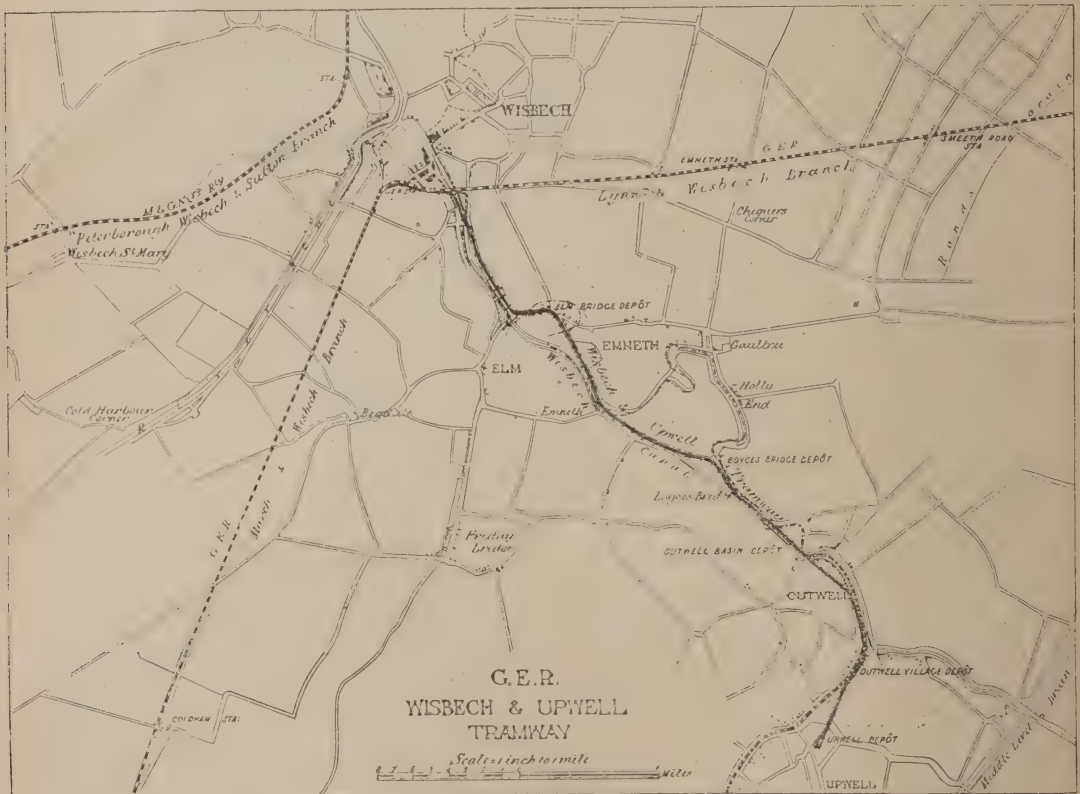
BY SCOTT DAMANT, *General Manager's Staff, Great Eastern Railway*



IF a history were written dealing with the railway enterprise as exhibited in this country during the last decade of the present century, the characteristic features of the years 1897, '98, and '99 would undoubtedly be the multipli-

of the most feasible means of benefiting rural districts situated away from the main lines of transit yet devised.

The chief difficulty in the way of providing light railways in the past has been the financial one. Obviously the districts where such lines would be a boon are poor, scantily populated, and devoted almost entirely to agriculture. Local landowners are, in such cases, seldom wealthy, and outside capitalists

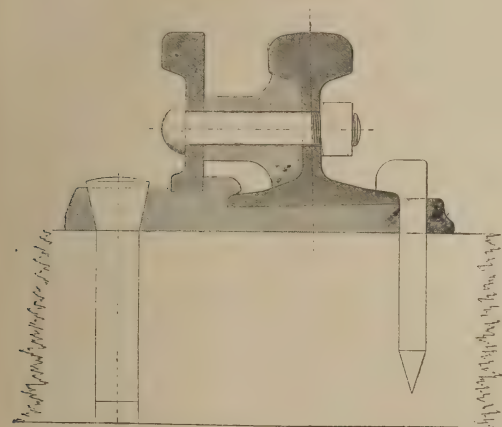


cation of schemes for the provision of light railways. For some years past it has been recognised that light railways constitute one

fight shy of providing the means wherewith to build a line between places they have never so much as heard of. A scheme for a light

railway between Little Puddington-in-the-Slush and Great Hogwell-in-the-Mire is of vast importance to the enlightened inhabitants of those idyllic spots; alas! it does not appeal so forcibly to the hard-headed man of means with a partiality for a fair return in the way of interest on his investments generally.

Wherever there is a thriving manufactory the rail has come to it or it has gone to the rail. The conveyance of the raw article to the manufactory, and of the finished goods from



SECTION OF THE RAIL, GUARD RAIL, SLEEPER, ETC.
OF THE WISBECH AND UPWELL TRAMWAY

it, pays the railway company well enough, but the rates for grain, roots, manure, and so forth, are now so universally low that the carriage of agricultural produce may be said to be probably the least remunerative of all railway goods traffic. Consequently railways have become increasingly reluctant to extend their lines into purely rural districts, and our agriculturalists have suffered, although agriculture is, after all, still the staple industry of the country, engaging, as it does, far more of the population than any other.

In 1895 a practical step was taken towards removing the financial difficulty in the way of an extended system of light railways. The Queen's Speech that year referred to "A proposal for facilitating the construction of light railways," which it was hoped would "be found beneficial to the rural districts." A Bill was

consequently introduced and passed into law in 1896, whereby it was provided that, where the council of any county, borough, or district have agreed to advance any sum to a light railway company, the Treasury may lend the company a sum not exceeding one quarter of the total amount required, at an interest of not less than $3\frac{1}{8}$ per cent. Another clause in the Act provides that "where it is certified to the Treasury by the Board of Agriculture that the making of any light railway would benefit agriculture in any district, or by the Board of Trade that by the making of any such railway a necessary means of communication would be established between a fishing harbour or fishing village and a market, or that such railway is necessary for the development or maintenance of some definite industry, but that owing to the exceptional circumstances of the district the railway would not be constructed without special assistance from the State, and the Treasury are satisfied that a railway company existing at the time will construct and work the railway if an advance is made by the Treasury," then the Treasury may advance a sum not exceeding one-half the total amount required for the construction of the railway.

The interest taken in light railways has not been confined to this country, as is evidenced by the fact that at the sixth session of the International Railway Congress, to be held in Paris next year, question XXXVIII. (1 of section 5) will deal with "The Influence of Light Railways on National Wealth."

As a natural outcome of the Act of 1896, schemes for the construction of light railways abound on all sides, and therefore a little information about the Wisbech and Upwell Tramway may not be devoid of interest to the readers of the RAILWAY MAGAZINE. Strictly speaking the Wisbech and Upwell Tram may be best described as a judicious cross between the railway proper and the ordinary urban tramway. Starting from Wisbech Station, Great Eastern Railway, the tramway proceeds viâ Elm Bridge, Boyce's Bridge, Outwell Basin, and Outwell Village to Upwell, and as it traverses an entirely agricultural district it

constitutes a valuable object-lesson to those interested either in the promotion or the working of light railways.

The ancient town of Wisbech, situated on the banks of the River Nene, is the commercial capital of the Cambridgeshire fen country. It is a well-built, spacious town, and under the rule of its mayor and corporation evinces considerable vitality, alike in the development of its agricultural resources and in the furtherance of its trade as a port. Since 1847 the Great Eastern, or its predecessor, the Eastern Counties Railway, has served Wisbech. The Midland, too, has been there for a good many years, and since 1889 the Great Northern has had joint access with the Midland. As far as the journey to London is concerned, the shortest route is, of course, *viâ* the Great Eastern, the distance from Wisbech to Liverpool Street Station being under 94 miles. The Midland and Great Northern Companies, however, help to put the town in touch with other parts of the country. Altogether Wisbech, although it can only boast a population of about 10,000, has little to complain of in the matter of railway conveyance.

Although the facilities for transit from Wisbech have long been all that could be desired, until a few years ago the statement that such was the case contained little but an interesting topographical fact to the inhabitants of a vast stretch of land which lay almost at its doors. If the reader will glance at a map of the Great Eastern Railway he will see the land in question situated partly in Cambridgeshire and partly in Norfolk. Surrounded as it is on all sides by the Great Eastern Railway, it has

the appearance of an inverted triangle, of which the base is the line from March to Magdalen Road *viâ* Wisbech, and the apex is the City of Ely. Now, that triangular piece of land in the very heart of the Fen country has always been most admirably adapted for the growth of fruit, roots, and corn, but until some mode of transit was devised whereby this produce could be taken expeditiously and cheaply to the rail the fertility and richness of the soil was of but little benefit to those who owned and farmed it.

During the later sixties and early seventies several schemes were devised for traversing this district by ordinary railway, and in 1873 a Bill was actually passed entitled "The Upwell, Outwell and Wisbech Railway Act." It was, however, easier to pass an Act of



WISBECH STATION, GREAT EASTERN RAILWAY, SHOWING PLATFORM
USED BY THE WISBECH AND UPWELL TRAMS

Parliament than to find the money needed to build the railway. After several ineffectual efforts to "raise the wind" the promoters formally abandoned the scheme in 1884, the Great Eastern Railway having in the meantime obtained powers to construct, and actually opened for traffic, what is known as the Wisbech and Upwell Tramway. The Act for

the construction of this tram was passed in 1881, and the line was opened on August 20th, 1883, as far as Outwell Basin, and as far as Upwell on September 8th, 1884.

The plans for the tramway were prepared by Mr. John Wilson, then Consulting Engineer to the Company, now Engineer-in-Chief, and the work was carried out under the direction



ELM ROAD STATION, WISBECH AND UPWELL TRAMWAY

of Mr. Harry Jones, now District Engineer at Ipswich. The tramway runs sometimes on the main road, sometimes on the green sward alongside, and sometimes over private property, which, of course, had to be acquired. Generally speaking the landowners were quite willing to sell on reasonable terms, as they recognised that the tram would materially increase the value of their remaining property. In one case, however, the owners claimed £590 for 2r. 15p. of land situated about a mile and a half from Wisbech. The Company contested this, and the jury at Wisbech awarded the owners £250, including compensation for severance. This verdict probably had a salutary effect on any other owners who may have been disposed to be exorbitant in their demands, and the rest of the land was purchased at a moderate figure.

The tramway is so constructed that when on the roads it complies with the Board of

Trade requirements in such cases, and when off the roads it is in the nature of an ordinary light railway. The metals, 50lb. to the yard, are fish-plated and laid on permanent-way chairs and sleepers, the gauge being the ordinary rail gauge of 4ft. 8½in. Where the tram runs along the public highway the sleepers are covered with ballast to the level of the

road, and the metals are protected by guard rails, which form a groove for the flanges of the wheels. The tramway is so laid that ample room is left for ordinary vehicular traffic, in no case approaching nearer than 8ft., and very seldom nearer than 10ft., to the crown of the road. The steepest gradient on the tramway is 1 in 32, and the sharpest curve has a radius of 120ft. Probably the most important engineering work is the wrought-iron girder bridge, of 25ft. span and 25ft. wide, which crosses the Wisbech Canal, erected in place of the old brick bridge, called the

New Common Bridge, which was of 16ft. span and 16ft. wide. The approaches to the bridge had to be considerably reduced and the gradients rendered more easy. Bridges had also to be erected over Outwell Basin and over the River Nene at Outwell Village.

The cars start from and end their journey at the Wisbech Station, alongside of an island platform, which on one side of its length is 1ft. 2in. high only. This is because the height of the floor of the tram from the rail level is 3ft., against 4ft. 2in., which is the difference between the rail level and the flooring of an ordinary carriage. Originally waiting accommodation was only provided at the terminus at Wisbech, at the terminus at Upwell, and at Outwell. Subsequently, however, such accommodation has also been provided at the other fixed stopping places. The term "fixed stopping places" is used because the tram stops to pick up or put down passengers at

any spot *en route*. The waiting accommodation at Elm Road was only erected last year.

The staff at each of the dépôts consists of one man only, except at Upwell, where a lad is also employed. The tickets are issued by a conductor, who travels with the tram and collects the money. There are no signals whatever, the service being purely a shuttle-cock one. At present it is as under:—

		morn.	morn.	morn.	even.		even.		even.	even.	
WISBECH STATION	... dep.	7 15	9 43	11 45	2 28	} Not Sats.	3 0	} Sats. only.	5 0	8 0	...
Elm Bridge ...	...	7 26	9 55	11 58	2 41		3 13		5 12	8 13	...
Boyce's Bridge ...	...	7 41	10 9	12 12	2 55		3 27		5 26	8 27	...
Outwell Basin ...	...	7 49	10 17	12 21	3 4		3 36		5 35	8 36	...
Outwell Village ...	...	7 57	10 25	12 27	3 10		3 42		5 41	8 42	...
UPWELL ...	... arr.	8 5	10 33	12 35	3 16		3 50		5 49	8 50	...

		morn.	morn.	even.	even.		even.		even.	even.	
UPWELL ...	... dep.	8 15	10 33	1 0	3 19	}	3 55	} Sats. only.	6 5	8 55	...
Outwell Village ...	...	8 23	10 46	1 8	3 27		4 3		6 13	9 3	...
Outwell Basin ...	...	8 31	10 54	1 16	3 35		4 11		6 21	9 11	...
Boyce's Bridge ...	...	8 40	11 4	1 23	3 43		4 19		6 31	9 18	...
Elm Bridge ...	...	8 53	11 17	1 37	3 56		4 32		6 43	9 32	...
WISBECH STATION ...	... arr.	9 5	11 28	1 50	4 8		4 45		6 55	9 45	...

On Sunday the train does not run.

When the tram terminated at Outwell Basin uniform fares were charged of 3d. first class and 2d. third class for any distance. Now, however, the following graduated scale is in force:—

	1st Class.	3rd Class
Wisbech and Outwell Village or Upwell ...	4d.	3d.
Elm Bridge and Upwell ...		
Wisbech and Boyce's Bridge or Outwell Basin ...	3d.	2d.
Elm Bridge and Outwell Basin, or Outwell Village ...		
Boyce's Bridge and Outwell Village or Upwell ...	2d.	1d.
Outwell Basin and Boyce's Bridge, Outwell Village or Upwell ...		
Outwell Village and Upwell, Wisbech and Elm Bridge, Elm Bridge and Boyce's Bridge ...		

During the year 1898 the total number of passengers carried amounted to 114,307. But, of course, it was principally as a goods line that the tramway was constructed, and in the conveyance of cattle, roots, fruit, vegetables, hay, straw, and corn to the outer world, and of coal and manufactured articles generally from the outer world, it has been of indubitable service to the inhabitants of the district it serves, and they are almost unanimous in its praise. That there are some grumblers is, of course, inevitable. In this case the dissentient minority is composed of certain small shopkeepers in the villages, who

complain that since the advent of the tram many of their former customers have paid weekly visits to Wisbech, there to do their shopping. The need of the tram, however, is proved by the large quantity of goods and coal carried over it.

Now, with regard to the rolling stock used on the tramway. The engines were designed for the purpose by Mr. T. W. Worsdell, then

Locomotive Superintendent of the Great Eastern, and till latterly of the North Eastern Railway. They are not built with a view to attaining any great speed, as the tram is not permitted to proceed at a greater rate than

eight miles an hour. They are designed to work from either end, with brakes so powerful that the engine and cars, when going at the full stipulated speed, can be stopped in their own length. In addition, there are automatic regulators, which will shut off steam, and thus prevent the engines going at a greater speed than eight miles an hour. The cylinders are of 12in. internal diameter, the pistons having a stroke of 15in. The wheels are of cast-steel, 3ft. in diameter, and the distance between the centres is only 6ft. 6in., to enable the engine to take the curves easily. The maximum steam pressure is 140lb. per sq. inch, and



LOCOMOTIVE FOR THE WISBECH AND UPWELL TRAMWAY
Wheels, 3ft. diameter; Cylinders, 12in. diameter, 15in. stroke

by continuing the exhaust pipe into the water tank, which contains 400 gallons, the waste steam is condensed, so that very little is emitted when the engines are at work. A feature of the engines is their being cased in with wood and sheet-iron, so that none of the working parts are visible from the outside.

They are so quiet in their movements that it is very seldom that horses or other animals are frightened when passing the tramway. At each end of the engines is a cow-catcher, which extends to within four inches of the ground.

In spite of some fears expressed when the scheme was first mooted, the mishaps on the Wisbech and Upwell Tramway have been few and

far between. Occasionally a young and venturesome cow has been known to dart in front of the engine, and try conclusions with it. The result, as predicted by the great originator of railways, has been "verra bad for the coo." On the occasion of the opening of the first portion of the tramway a horse



COMPOSITE BOGIE CARRIAGE, WISBECH AND UPWELL TRAMWAY

attached to a Midland Railway trolley became restive, and, turning off the road, dragged the trolley through a quickset hedge into a garden. This may have been through fear of the tramway; on the other hand, it may be that the poor brute recognised that with the advent of the iron horse such predatory visits as his into Great Eastern territory would cease to be as profitable to his owners as hitherto. This view is strengthened by the fact that shortly afterwards a Great Eastern trolley was met with a horse in the shafts, and another fastened behind. The animals cocked their ears and gazed inquiringly at the strange monster approaching them. On observing that it was branded with the familiar initials "G.E.R.," the sagacious beasts proceeded calmly on their way. This

simple little anecdote is perfectly true. Should any reader of the RAILWAY MAGAZINE presume to doubt it the writer can procure a clergyman, an ex-mayor, and a policeman to substantiate the story. But the unbelieving inquirer must pay all expenses!

The cars are divided into two classes, which were formerly known as first and second class respectively. On January 1st, 1893, the Great Eastern Railway Company abolished second class throughout their system except in the suburban and Continental services, and since that date the classes have been designated first and third. In appearance the cars are somewhat like the familiar street tramcars. The number of vehicles used varies with the time of the year and the requirements of the traffic. Nine vehicles constitute the maximum in a pas-

senger train, ten in a mixed train, of which four may be goods trucks. Coal trains consist of four trucks in winter and five in summer.

The results of the working are considered satisfactory to the Company, especially in the matter of goods traffic. In consequence the Great Eastern obtained power in 1895 to build a tramway as a goods line only from a point



EW ROLLING STOCK, WISBECH AND UPWELL TRAMWAY

near Whittlesea to Benwick. This work has now been carried out.

And now a word of warning to those interested in light railway undertakings. The Wisbech and Upwell Tramway pays the Great Eastern Railway Company not so much directly as indirectly. This is because the great bulk of the goods traffic does not commence or terminate at Wisbech, it is carried over the main line of the railway to or from that place. Were the tramway a separate undertaking solely dependent on its own earnings, with a manager, secretary, and clerical staff drawing salaries, and a board of directors receiving fees, if asked whether it would then pay or not, the writer could only piously exclaim with the erstwhile famous Dr. Byrom, "God bless us all, that's quite another thing!"



“ICHABOD”

THE LAMENT OF A 7FT. SINGLE

In days of old, when “Jenny Linds”
And “Little Sharps” were jogging,
I raced the swallows and the winds
And never needed “flogging”;
I drew their trains at any pace
From sixty up to eighty—
Ere third-class trav’lers found a place
And loads grew over-weighty.

But later, when the third class came,
And heavy loads distressed me,
They said that I was going lame,
And it was time to rest me;
They humped my boiler with a dome
And robbed me of my beauty;
With fire-box raised they sent me home
To do my novel duty.

My graceful lines and comely size
All connoisseurs delighted,
And folks would flock to feast their eyes
On form with pow’r united;
I cost them little for repairs,
I saved them tons of fuel,
They let me mind my own affairs
And voted me a jewel.

Time was when trav’lers were content
With “something” at a station,
Or even uncomplaining went
In absolute starvation;
Now every third-class cove must dine
And wash *en route* and slumber,
And I must hustle up the line,
Weighed down with kitchen lumber.

They superadd incessant tons,
They grudge me every minute;
“Cranks” clock and chronicle my runs
And ask if I am “in it”;
My life is all one nightmare race,
My merits disregarded,
I daily dread the last disgrace—
To find myself discarded.

A. B. S.



THE COUNTRY TERMINI OF THE (LOCAL) LONDON RAILWAYS

RAILWAY COMPANIES.

Metropolitan District Railway

Metropolitan Railway

North London Railway

TERMINI.

{ Richmond,
{ Ealing,
{ Wimbledon.

Richmond.

{ Richmond.
{ Kew.

By W. J. SCOTT, B.A.

(Continued from January)



HOW the Metropolitan Company's trains escape from the "vicious Circle" into pure air we have already explained. It might be objected that the true "country" terminus of the Metropolitan is not Richmond but Verney Junction, a desolate spot nearly 50 miles from London, on the Oxford and Banbury branches of the London and North Western. The truth is, however, that the Metropolitan is, in respect of its Harrow and Aylesbury extension, not a true local London railway at all, but an ordinary provincial one, carrying parcels and other things which differentiate the "under-ground" systems from the rest of the railway world.

Owing to the Aldgate-Richmond service being a joint one with the Great Western, who now work a full half of it, the number of the Metropolitan Company's own trains in and out of Richmond is nowadays but a small one—seven in each direction. Starting as they do from New Cross at their London end, in the 76 minutes of transit they contrive to pass under or over about half the metropolis, and to cross more "frontiers" than an East Coast train does between King's Cross and Aberdeen. At New Cross they are on South Eastern terri-

tory, whence they pass almost at once on to that very "joint" line, the East London, worked by the Metropolitan, Brighton, District, and Great Eastern Companies. The last-named is not one of the owners, but the South Eastern and Chatham and Dover are, though they run no trains. Half a mile north of Shadwell Station the true East London line is left for the "Whitechapel extension," of which the District and the Metropolitan are joint owners. At the further end of Aldgate East Station the Metropolitan's own territory is entered; this continues to the entrance to Bishop's Road Station. The station itself is in Metropolitan occupation, though (as an *annexe* to Paddington terminus) it is owned by the Great Western. Beyond this point the Metropolitan hold running powers only as joint proprietors of the Hammersmith line. Thus they are on "foreign" ground until Westbourne Park, inclusive. There the joint "Hammersmith and City," of which the Great Western are co-owners, begins. Midway between Shepherd's Bush and the Hammersmith terminus comes the junction spur into the "Kensington, Hammersmith, and Richmond" line of the South Western Company, and from that point onward to Richmond the latter Company's territory is traversed. From New Cross to a little west of Ravenscourt Park Station the journey is made wholly through

the county of London; thence to the middle of Kew railway-bridge it is in Middlesex, after which point it lies through Surrey. The number of different parishes, civil and ecclesiastical, or of municipal areas passed through, including the City of London and the borough of Richmond, is "a thing imagination boggles at."

The North London's way out of the London smoke can be learnt from the accompanying map. It is not so chequered a journey as that of the Metropolitan, though there are three frontiers to cross on the way. The first is at Camden Road Junction, where—since the Hampstead Junction line, originally worked by the North London, changed hands—North Western ground is entered. Over this stretch the North London have kept independent rights, so as to have free access to their own possessions beyond Willesden—their own, that

is, as to actual administration, for since the year 1871 the North and South Western Junction line (opened in 1853) has been *owned* by North London jointly with the North Western and Midland. The latter Company now work a scanty service, from their main line at Cricklewood, over it between Acton Wells Box and Gunnersbury, otherwise the passenger trains are all North London, as are (in pattern) the stations, cabins, mile-posts, and uniform of the officials. Owing to the rebuilding of the high-level part of Willesden Junction the second frontier ground is no longer reached there (the North London platforms having been swept away), but about one-third of a

mile south, at Old Oak Junction. At Bollo Lane Box, just beyond South Acton Station, comes a fork; to this point the service is half-hourly. Then the trains run either to Richmond—entering South Western territory at once and joining the inevitable "Kensington and Hammersmith" line at Gunnersbury—or to Kew, passing from North London to South Western metals at the short curve by which they enter their portion of Kew Bridge Station. As a rule the trains alternate between the two places, giving an hourly through service to each, supplemented in the case of Kew by short connecting trains from Acton

in connection with the Broad Street - Richmond ones.

The most curious thing about the North London service is the way in which the line of route has been shifted over and over again. Its old City terminus was Fenchurch Street, a station into which it now runs no



RICHMOND (NEW) STATION, LONDON AND SOUTH-WESTERN RAILWAY
The terminus of the Metropolitan District, Metropolitan, Great Western, and North London Railway Companies' Services

trains. At the other end of the journey Kew, Twickenham, Kingston, and (New) Richmond have been successively the terminal points. The first-named, it is true, has never lost its privileged position altogether, but even there the actual station has been changed. So also the intermediate route has been varied. At first it lay over the North Western main line from Camden (Chalk Farm) to what is now Willesden Junction (long before such a station existed), turning off through "Old Oak" (Willessden low level) goods yard; then it was diverted, on the opening of the Hampstead Junction line, to its present way through Ken-tish Town and Brondesbury. The trains,

however, except two through business expresses, started from Camden Road Station (since closed) until, on the opening of the Broad Street section, the present through service was established. Even the little single

the Hammersmith vehicle. On the opening of the City line to Broad Street the through vehicles were given up, and the branch train (engine and one coach) ran to and from Acton (N.L., main, or "Churchfield Road"), from



line branch to Hammersmith (North London) has seen many alterations. In early days there was one composite coach for it on each of the trains from Camden, these being slipped at the junction box known as Acton Gatehouse. The "ups" stopped at this point to pick up

the junction box to the station, and *vice versa*. The train was *pushed*, the engine being at the rear. Then in 1880 South Acton Station was opened, and the branch was prolonged beside the main line for about a quarter of a mile into the new station.

For a short time, somewhere in the early fifties, some North London trains ran forward by Old Kew Junction over the South Western to Brentford and Hounslow. This, however, has now become but a dim tradition even at Broad Street.* It seems to have been only a short-lived experiment. A few years later, however, a large proportion of the Kew trains were worked forward by London and South Western engines to Twickenham. At first these trains "reversed" in Barnes Station, but they were soon diverted round the "Barnes curve"—an avoiding loop made specially for this service. They all called at Mortlake and Richmond. In 1864 they were extended from Twickenham by the Teddington branch to Kingston (low level). Perhaps owing to the length of journey—90 minutes to Fenchurch Street was the least time from Kingston-on-Thames—their passengers were scant, and their number fell off from ten, out of a total of fifteen trains at Kew in April, 1864, to only six, when four years later the full half-hourly service to and from Broad Street was established. In 1869, the connection with the new Richmond line of the South Western being completed, with running powers to the North London, the through working *viâ* Kew was wholly given up, and Richmond became the southern boundary of the latter Company. It is so unusual for a railway to thus withdraw from even the most Fashoda-like spots where its engine head-boards have once been displayed that it seems worth while to give this bit of "ancient history" somewhat in detail, and to specially indicate the "evacuated territory" on the map.

Of the places themselves which are now the North London's termini,

RICHMOND,

of course, claims first place. The town is

* The courteous Superintendent of the Line, Mr. Dunn, confirmed our impression that there had once been such a service, but he could find no particulars of it. On other points in this article he kindly gave much valuable information.

[A service of through trains was run between Fenchurch Street and Windsor *viâ* Kew from June 1st to October, 1854. Previously the L. and S.W.R. ran trains between Brentford and Willesden.—ED.]

famous for its unique river view from the high "Terrace," and for the Royal park which adjoins it. However, it will save repetition in making inevitable comparisons with Ealing—the two places being so curiously "of a muchness"—if they be described together, and therefore our notes on the town of Richmond we will relegate to the next (and final) article.

Its one and only railway station—for the "old" and "new" sections are really but portions of the same station, and under one stationmaster—is far in advance of anything that Wimbledon can show, although it can hardly be deemed worthy of the borough's rank and its own importance as the suburban terminus for five distinct services.

The "old station" (it was "new" early in the fifties) is a plain, two-platformed "intermediate," of fair size, but with nothing noteworthy about it. The "new station," which is an absolute terminus, has a good-sized front on the road-level, with a fine roofed-over stretch of cross-platform, on which are some shop-stalls as at Waterloo. From this run out three platforms (two are "islands"). These are much too narrow, and their roofing is of the "tin-umbrella" type. There are no less than six roads to them (one used only as a "lay-by"), and the bad example of Waterloo is followed by trains being worked in and out of any of them seemingly at random, so that no one ever knows beforehand from which platform his train is likely to start. The North London Railway have their own ticket office, and book through by Willesden to all parts of the North Western Company's system and its connections. For a few years the Midland Company ran trains into the station—from Kentish Town, if we remember rightly—but their Richmond service did not answer, and was soon given up.

Richmond's railway history dates from the beginning of 1848, when the present Windsor line was opened from a junction-box where Clapham Junction now stands to a terminus in the present Richmond goods station. The trains started, of course, at the London

end from Nine Elms, with intermediate stations at Wandsworth, Putney, Barnes, and Mortlake.

The service was a very good one for those days, there being no less than seventeen trains each way. Two of these were "expresses," with fares to match, making the direct run in fifteen minutes. On Sundays there were actually eleven in either direction. When, some five years later, the line was prolonged to Twickenham, Richmond found itself supplanted in railway importance by its smaller neighbour across the water. Even at this day Twickenham boasts two or three more London trains than Richmond "Old Station" can show. The opening of the Kensington, Hammersmith, and Richmond line in 1869, with the erection of the "new" or terminal half of the station, redressed the balance, however. This at once brought a connection with the Chatham and Dover (by Ludgate Hill trains of the South Western) and a greatly bettered North London service. The Metropolitan followed a few years later—their service being suspended, begun again, and latterly shared in by the Great Western—and in 1877 the District followed suit.

Meanwhile, the number of trains on their old line—now extended to Windsor, with many offshoots—had steadily grown, until the present ample supply was reached, leaving Wimbledon as the sole superior in this respect in the whole of "Greater London." As a map we hope to supply next month will show, the two-fold station is as near as may be to the middle of the town; it is entered from George Street,

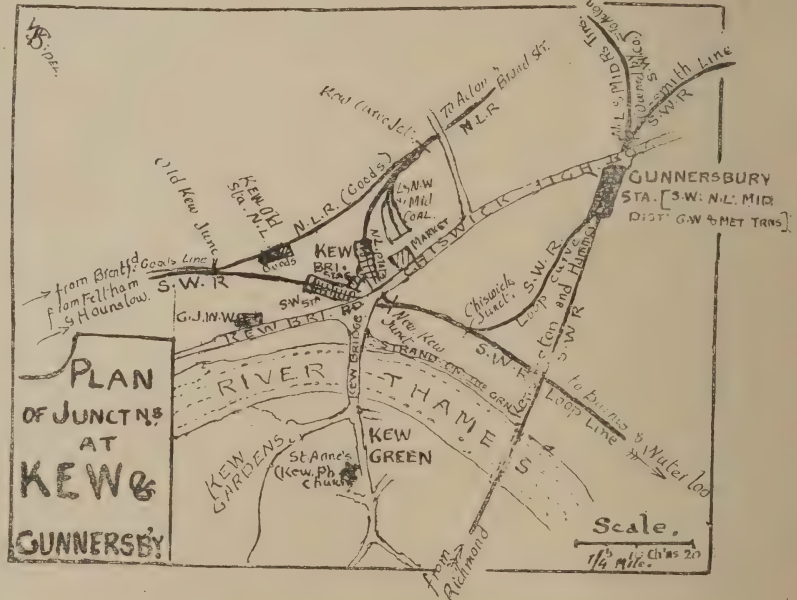
one of the best and most important thoroughfares.

TABLE OF RICHMOND TRAIN SERVICES (UP).

At "OLD STATION."	
To Waterloo, from Reading, Windsor, Sheperton, or Kingston*	60
Terminating at Richmond, from Waterloo, via Wimbledon and Kingston.....	2
Total.....	62

At "NEW" TERMINUS.	
South Western Company's trains (via Kensington) to Waterloo, 15; Ludgate Hill, 13.....	129
District Company's trains to New Cross (L.B. & S.C.) (or Whitechapel)	25
Metropolitan and Great Western joint service via Hammersmith and Paddington [Metropolitan Company's trains to New Cross (S.E.), 7; Great Western Company's trains to Aldgate, 10]	17
North London Company's trains to Broad Street	19
Total.....	90

Total number of up trains at Richmond Station ("old" and "new" portions together).....	152
Total number of L. & S.W. Co.'s trains.....	91
Total number of "foreign" trains.....	61



As all the above trains run to some London station—most of them, indeed, call at many stations within the metropolis—the number of

*Of the Kingston trains 16 are really "roundabouts" from Waterloo via Wimbledon.

+ Includes one short train to Hammersmith.

trains, Richmond to London, is the same as the whole number given above, less the two which come from the Wimbledon direction and terminate—*i.e.*, 150. This, though a very good allowance, falls much short of Wimble-

Street, the distinction between "express" and "stopping" is in this case a very fine one, and by no means Foxwellian. Midway between them, at 8.24, the Great Western start the first of their trains to Aldgate. The number

of through City passengers by it is not large, as it gets to Bishopsgate (Metropolitan) just one minute after the 8.31 North London is due, just over its head, into Broad Street. This ends the list of different companies and destinations. Five companies and six different termini in 50 minutes is not a bad record. The remaining trains are: 8.40 District, 8.54 Great Western, and 8.59 South Western to Waterloo, a total of 11 trains in 80 minutes. During the same period seven trains (two of them fast) to Waterloo by Clapham Junction call at the old station.

The "Kew Road, Richmond," passes by a continuous line of villas opposite the wall of the gardens through the suburb known as "Kew Gardens" into "Richmond Road, Kew," the two being, in fact, one thoroughfare. Thus it is an easy and natural transition to the earlier and quainter "country" terminus of the North London—*viz.*,

KEW.

Notwithstanding its tramways—one on each side of the well-known bridge—its market, and the big waterworks, Kew is undeniably quaint. The Green, with its copper-cupolaed, red-brick church—a true relic of Queen Anne's days, and therefore dedicated to St. Anne—is picturesque and rural. The parish (of which St. Anne's is the parish church) lies wholly in Surrey, and for municipal purposes now forms part of the borough of Richmond; but at least half the village, with both Companies' stations, an hotel and concert-hall, and some good shops, lies across the fine stone bridge over the Thames in Middlesex. On this side,



KEW BRIDGE

Showing the Tower of the Grand Junction Waterworks

don's magnificent total. All from the "new" station, of course, have Richmond as their starting-point, as the station is a terminal one. Only *one* up train out of the sixty from the old station starts from Richmond—the 7 a.m. to Waterloo.

Between 7.40 and 9 a.m. no less than eleven trains steam out of the new station. At the former hour a District, and five minutes later a Metropolitan, start for New Cross, diverging at Shaftesbury Road. They come again on to each other's track at Aldgate (East), where the District train has gained one minute on its competitor. Keeping the six minutes between them through the Thames Tunnel, they diverge again to their respective stations, some half-mile asunder, at New Cross. At 7.55 a.m. a South Western leaves for Ludgate Hill, followed by one of the same Company at 8.2 to Waterloo *viâ* the Battersea curve. At 8.10 another District train starts for New Cross. At 8.19 is a North London "ordinary," and at 8.31 an "express." As the latter only gains two minutes on the former into Broad

stretching along the river strand between the two bridges (road and railway), is another picturesque bit, with old houses and quaint "maltings," known locally as Strand-on-the-Green. It is from this point that the accompanying view of the soon-to-be-rebuilt bridge, with the fine tower of the "Kew Waterworks" (Grand Junction Co.) standing up beyond it, is taken. Adjoining the railways is a large market for vegetables and other garden produce. This *dépôt* first set itself up (for it was "self-sown") in the South Western station-yard, until the Brentford Urban Council, on the confines of whose district it lay, built its present useful but nowise "stately marketplace." In this they forestalled their Chiswick neighbours, who hold the opposite side of the road—much-partitioned Kew has been likened to Poland—but they need not have inscribed "*Brentford Market*" on the concrete front of the building. For there is a market, of sorts (boot-laces are sold there and an occasional apple), at Brentford itself.

From August 1st, 1853, and for nearly nine years afterwards, there were two wholly distinct Kew passenger stations, about 300 yards apart. In the spring of 1862 the North London Company's tables bore the announcement, which "Bradshaw" of that date also gives—viz., "Opening of the new station at Kew. The trains set down and start from platforms in connection with the South Western *Kew Bridge* Station (close to the main Brentford Road). The old North London station in the lane is closed." Though this closed 37 years ago, the "old station in the lane" (which lane is now called Lionel Road, and is said to lead to Ealing, but stops short half-way) still has its buildings standing, and one of its platforms seems to be in use yet as a goods-bank. For some years such North London trains as got so far—about ten to a dozen each way—ended there, but late in the fifties the Twickenham service already mentioned was put on, about one train in two working forward, with a double "reversing," at this point and also at Barnes. For a while these trains also called at the South Western station to pick up

locally. This must have been, until the absurd St. Paul's and Ludgate Hill double stop, the shortest run on record. It was thus, to distinguish it from "Kew, N.L.," that the South Western station first took its name of "*Kew Bridge*,"* which was revived on the opening of "Kew Gardens" Station, and is now in general use. A curve, 33 chains long, made by the South Western Company, but used solely by the North London, was opened in 1862, and brought the latter Company's trains into the portion of Kew Bridge Station which they use to-day. The before-named "Barnes curve" being opened about this time, a direct run to Twickenham was now practicable, though a change of engines was still made at Kew. Twenty years ago all through passenger working at this point ceased; South Western coaches, formerly common objects on the Acton line, disappeared from North London territory, and the present half-hourly service (alternately Broad Street and Acton local trains), with Kew as the starting point, was established.

With the exception of Addiscombe Road, Croydon, it would be hard to find a less imposing terminus to a line of any importance than the present Kew Bridge one of the North London—a queer contrast to their smart station, with its noble booking-hall, only two miles off at Acton. The Broad Street authorities would doubtless lay the blame on the shoulders of the owning company.

The South Western station, on the Hounslow or "Loop line," is decent, with an above-ground front to the great main road to the West—"Chiswick High Road," we believe, at this point. Opposite to it stands a handsome drinking-fountain. It has about 30 trains to and from Waterloo, and 16 of the "semi-roundabout" service between Gunnersbury, Hounslow, and Twickenham, these latter giving something of a connection with the District, Metropolitan (and Midland) trains at Gunnersbury. The North London trains also number 30 (including one up "express"), of which 17 are through to the City.

* This name, which is earlier than the railway, occurs in Dickens' "*Oliver Twist*," where "*Kew Bridge*" is mentioned as one of the villages through which the burglars drove. The Surrey part is often distinguished as "*Kew Green*."

RAILWAY LITERATURE

"THE EVOLUTION OF THE STEAM LOCOMOTIVE."

[By G. A. Sekon.]

Extensive as is the literature already existent on the subject of the locomotive engine, there is always room for another book on that interesting and fascinating topic. As each new work comes out it so obviously fills a previous void that it in its turn becomes indispensable to every student of railway engineering and locomotive history, and as a rule promptly takes its place among the classics of that science or history.

Mr. Sekon's new work on the "Evolution of the Steam Locomotive" will undoubtedly hold a good place among the literature of the railway engine. Foremost among the essential qualifications of one who would write such a book may be placed unwearying industry and the capacity for patient and persistent research into the voluminous and often obscure records of the past. These qualifications the author has proved himself to possess in a very high degree. He has acted implicitly upon the rule laid down by Lewis Carroll's king—"Begin at the beginning; go on until you come to the end; then stop!" And so Mr. Sekon starts with the early experiments of Richard Trevithick in the first year of the present century—truly the "Railway Century" of the world's history—and goes on until he reaches the latest engines turned out during the year just expired. His account of Trevithick's first journey through the streets of Camborne on Christmas Eve, 1801, and his subsequent trip thence to Plymouth, when a timid toll-keeper took him for the Prince of Darkness in person; of Trevithick's second locomotive, which had a brick chimney that was constantly being knocked down by overhanging trees, etc.; of Blenkinsopp's, Brunton's, and other early locomotives, will be new to many readers and will assuredly be read with avidity. The achievements of Hackworth and Hedley next come under review, and soon we reach George Stephenson, the father of the locomotive as we know it in

these days, although it may be noticed that Mr. Sekon credits Hackworth with the inventorship of that all-important development, the steam-blast. The respective claims of Stephenson, Hackworth, Trevithick, Nicholson, Gurney, and others to the authorship of this essential feature of a successful locomotive are carefully examined, with the result that Mr. Sekon accords to Hackworth's "Royal George" the honour of being "the first successful locomotive." Even if all his readers do not accept his verdict on this moot question, they at least cannot fail to recognise the ability and ingenuity with which he has argued the case from his point of view.

It is needless to follow Mr. Sekon through all the successive stages of locomotive history which he has sketched in so lucid and interesting a manner. The readers of his book—whose name is sure to be legion in these days of "railwayac" enthusiasm—will prefer to do that for themselves; and they will certainly recognise that they owe a debt of gratitude to the author for the zeal and industry with which he has ransacked the archives of former days, and burrowed into the dark recesses where repose thousands of valuable documents that throw most useful light on the gradual evolution of that potent agent of civilisation and progress, the locomotive—the mechanical hero of Mr. Sekon's story. Naturally the author finds himself involved in several controversies, which have been carried on with some heat, regarding the origin and development of certain engines on the Great Western and London and North Western Railways. Here, again, it is not necessary for a reviewer to follow him or to assume a judicial attitude. Mr. Sekon has put forward his side of the case with remarkable clearness and force. It will rest with his readers to appraise the weight of his facts and reasoning, as opposed to any others that may already have been published.

Carrying on the narrative through the various types of locomotives produced by Stephenson, Hackworth, and Bury, the author brings us to what may be termed the "early middle age" of the locomotive—viz., A.D. 1845

to 1860. This period produced the famous broad-gauge 8ft. singles of Daniel Gooch, the "Jenny Linds" of E. B. Wilson, the "little Sharps," the long-boiler Stephensons, the "Bloomers" of McConnell, the "Problems" of John Ramsbottom, the "Cornwall" of Trevithick, the "Snake" of J. V. Gooch, the various Cramptons and Beatties, the Great Northern engines of Archibald Sturrock, and other once renowned machines. Some highly apocryphal "yarns" as to extreme speeds are quoted, but without receiving the *imprimatur* of the writer. One cannot help regretting, however, that he did not demonstrate their manifest absurdity. It may be well also to correct here a slight error into which he has fallen through wrong information as to the tank engines designed and built for the old Eastern Counties Railway by Mr. J. V. Gooch. It is not correct that "a steam dome was placed over the raised fire-box, and a screw-lever safety-valve on the boiler barrel." Both of these were added many years later. As originally built, none of J. V. Gooch's Eastern Counties engines, whether tanks of the No. 7 or No. 250 class, or express engines of the No. 274 class, or coupled engines of the 240 class for mixed traffic, had domes, a safety-valve column almost exactly similar to that used by him on the London and South Western "Snake" class being placed over the fire-box. This was replaced by his successor, Mr. Robert Sinclair, in 1857, with a safety-valve cover resembling a tiny dome, and that gave way later to the dome and safety-valve shown in Mr. Sekon's illustration. It may be added also that there were two more of the Gooch single expresses than he mentions, viz., Nos. 27 and 94, built in 1856, which replaced two old locomotives broken up.

Coming to the "later middle age," A.D. 1860 to 1875, the author deals with the numerous classes of improved engines that came out during that period, which of course include the Caledonian and Great Northern 8ft. single wheelers of Mr. Connor and Mr. Patrick Stirling, the 7ft. singles of Mr. Sinclair on the Great Eastern, the Brighton engines of Craven and Stroudley, the London and North Western 6ft. 6in. coupled of Ramsbottom and Webb, and other well-known types.

Finally, arriving at what may be termed modern times, from 1875 to the present day, Mr. Sekon gives very full accounts of most of the various designs which the period has pro-

duced, including Mr. Dean's Great Western single and coupled types, the different classes given to the London and South Western by Mr. Adams and Mr. Drummond, Mr. Billinton's new Brighton engines, Mr. J. Stirling's for the South Eastern, Mr. Kirtley's for the London, Chatham and Dover, Mr. Bromley's and Mr. Holden's for the Great Eastern, Mr. P. Stirling's latest singles on the Great Northern, and the various designs recently introduced by his successor (Mr. Ivatt), Mr. Webb's different types of compounds on the London and North Western, Mr. S.W. Johnson's Midland expresses, Mr. W. Worsdell's North Easterns, Mr. H. H. Pollitt's Great Centrals, and Mr. Aspinall's 7ft. 3in. coupled on the Lancashire and Yorkshire, the engines constructed by Mr. D. Drummond and Mr. M. Holmes for the North British, Mr. McIntosh's "Dunalastairs" and "Breadalbanes" on the Caledonian, and Mr. P. Drummond's latest Highland express, together with a miscellaneous multitude of tank and goods engines, a wealth of information regarding dimensions, etc., being afforded. The illustrations of all the periods are exceedingly numerous, and include almost every type of locomotive of importance. They are, as a rule, excellently done.

Altogether Mr. Sekon's new book may justly be characterised as a very valuable and acceptable one, which is certain to be in large demand.

CHARLES ROUS-MARTEN.

"COTSWORTH'S CARD CALCULATORS."

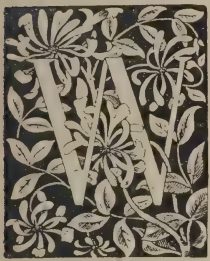
There is probably no one who has done more to lessen the work of the clerical officials of railways and kindred associations, to say nothing of traders and merchants generally, than Mr. M. B. Cotsworth. We have recently received from his publishers, Messrs. McCorquodale and Co., Limited, specimens of his unique and useful card tables, which are so useful in railway offices and shipping and business houses. Amongst those specially likely to save time and trouble may be mentioned: "True Kilo Card," for exchanging kilogrammes to British weights at exchange of 1,016 kilos per ton; ditto at 1,015 kilos a ton; "Mètres Card," for exchanging mètres to British yards; "4.80 Dollar Card," for exchanging dollars into pounds sterling; and "True Pood Card," for exchanging Russian poods to British weights. At the backs of the cards the exchange is reversed from British to those of the foreign countries.

ELECTRICITY'S CONTRIBUTION TO THE SAFETY OF RAILWAY TRAVELLING

By F. T. HOLLINS, *Telegraph Engineer and Superintendent, Great Eastern Railway*

(Concluded.)

[The illustration at top of page 47 in the January number should be described as "Hollins' Electrical Rail Contact," instead of as printed in some copies of the issue.]

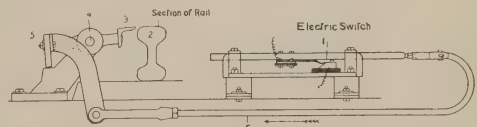


WE want to be quite sure when we *have* put this train into the siding that it really *does* clear the line, and that its tail end does not foul the line upon which the following, perhaps express, train may come. To provide for this at the entrance of, but inside, the siding a Sykes' electric fouling bar is fixed, of sufficient length to ensure that any vehicles entering shall always have at least the flange of one wheel on the bar to depress it.

A section of the rail is shown at 2 and the flange of each wheel depresses the bar 3 (the axis of which is at 4), raising the heavy balanced end (5), and pulling the rod (6) connected thereto by the angle piece in the direction of the arrow and actuating the switch (1). A few yards further in the siding a rail contact is fixed. Now the electrical circuit from this rail contact to the Sykes' locking instrument passes through the electrical contacts of the switch (1) of the fouling bar, and therefore the depression of the bar, by actuating the switch (1) *before the train reaches the rail contact*, breaks down the rail contact circuit, so that although the latter is operated as the engine passes over it it does not transmit an electric current to release the back lock until the last vehicle has passed over the bar. The instant the last wheel of the last vehicle passes off the bar the latter rises and

switch (1) joins its contacts together, and thus completes the rail contact circuit to the Sykes' instrument, and the train being at the moment on the rail contact and operating it a current is transmitted, and the Sykes' apparatus releases the lever and so restores the instrument. This ensures the tail of the train being clear of the main line before the following train can be accepted.

Then, again, at junctions of converging lines with very short sections, whilst the ordinary electric locking prevents trains being simultaneously accepted from both lines (as the plunging on one instrument instantly locks up the other), the locking instruments are so interlocked with the point levers that the points for a down road must be set so that an up train accepted could not possibly cross the path of a down train, and *vice versa*. The diagram, given on the next page, of the local and main lines at Stratford will best illustrate what is meant.



SYKES' ELECTRIC FOULING BAR

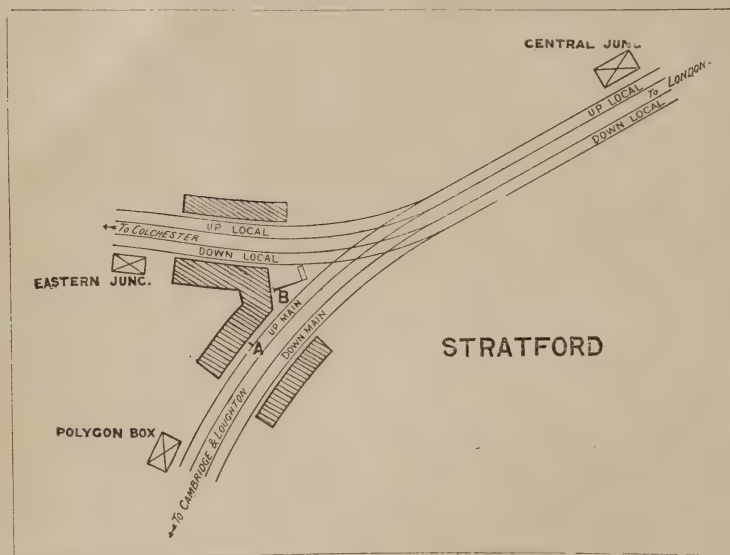
All the through lines, sidings, carriage roads, etc., are left out, only the lines concerned being shown and the one signal referred to. Now, referring to this diagram, before Central Junction can plunge to accept

D

and unlock the section signal for an up train from Polygon, he must set his down local points for down local to down main, so that a down train coming from London could not possibly pass across the path of the up train accepted from Polygon.

By reference to the diagram on the next page the reader is given an idea *diagrammatically* how this is done. Pray do not assume, Mr. Editor, that it is done as clumsily as the drawing indicates.

When this point lever (1), which is the lever for operating the points from down local to main, is put back in the frame as shown, the points are over to divert a train from down local to main, and the small Sykes' lever (2)



on the instrument shelf is unlocked. Pulling over this small lever unlocks the plunger (3) by raising rod (4), enabling the up train to be accepted; but the same motion of the small lever, raising the locking piece (5) on the rod (4) in the slot (6) in the tappet (7), mechanically locks the down points as set; and, at the same time, the armature (8) is raised up to the coils (9), and the small wheel (10) passing under the angle piece (11) on the rod (4), this small lever is itself, as well as the points, electrically locked. The wheel (10) holds the

rod up and therefore the small lever in position. The signalman may now plunge to accept the up train, and he can neither alter the points, the small lever, nor the plunger until the train has passed a rail contact at point "A" on the Stratford up main platform line, and the train is either standing at signal "B" at danger, or, if the latter is "off" (which would then mechanically lock the same points and signals down local to main, and be itself back-locked electrically), until the tail of the train has arrived well over the down road, and the signal again put to danger behind it. The small lever, being unlocked by the current from the rail contact at "A" and the starting signal, we will suppose, at "B" being to danger, the points, by means of lever 1, may be altered to down local; but this, by preventing the rod (4) from being raised—it cannot be, unless the locking piece (5) coincides with the slot in the tappet (7)—again locks the small lever and prevents another up train being accepted from Polygon. This arrangement is essential, because, being at a platform, we may require the train to stand there with the signal at danger, so that a train *may* be allowed to safely cross its path on the down local line. Bear in

mind the fact that contrary signals always lock each other—both cannot be off at the same time.

At other nearly similar converging lines, but not at a platform, the signalman is compelled to lower his home signal for one line (which, of course, mechanically locks the lever of the home signal for the other converging line, and the signal for the opposite road that would cross its path) before he can plunge to electrically accept a train in either direction. And such home signal being lowered enables

the signalman (by removing a bolt) to plunge and unlock the starting signal for the same line at the rear box; but the plunger and the signal alike remain locked in that position until the train so accepted has arrived and passed over the rail contact at the clearing point in the section in advance. Again, in the case of sidings and crossover connections, this same electrical and mechanical locking between points and plungers comes in. If an up train *has been* plunged for—that is, the rear box starting signal electrically released—the points leading from the sidings to the up line are locked. But, if the points are already over for a train from the sidings, then an up train *cannot be accepted* from the rear; the plunger is locked. And if the train from the sidings requires to cross over the down line, if the points are so set a down train cannot be accepted for the same reason; but if a down train *has been* accepted, the crossover points to the down road cannot be got until the accepted train has passed and the road is clear.

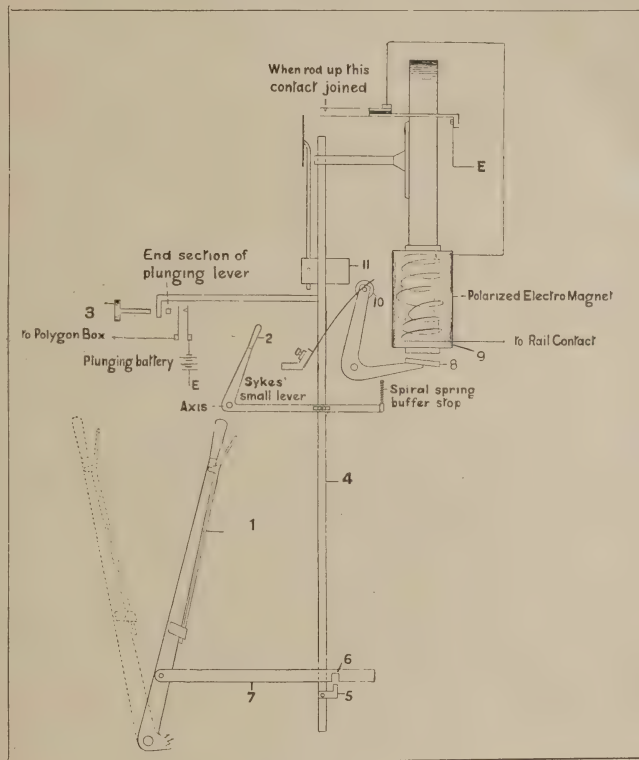
Such are a few of the methods of protection which the directors of the Great Eastern Railway, at a cost of over £30,000, have adopted and are constantly extending for facilitating and protecting the trains (especially complete on suburban lines) on the busy portions of the railway.

But this is only a fraction, important as it is, of the electrical arrangements. Between each and every signal-box there is either a single needle telegraph instrument or a telephone, and sometimes three or four, in connection with the next box and several succeeding signal-boxes. Locked up as their levers and instruments are, and secured *on the side of safety*, the signalmen can, in addition, instantly communicate one with the

other, and so verbally arrange the traffic; sometimes to suit their siding accommodation, or with passenger traffic to reduce an unavoidable delay to a minimum, and to deal promptly with any emergency that may arise.

Again, in numerous cases on busy portions of the line there are special and extra electric bell communications, known as the "Be ready" bells, from con-

trolling junctions to other similar junctions to tell, as express trains approach them, that they are coming, and to enable the advance junction to deal with his other trains, so that the line shall be perfectly clear to allow the express to pass without an instant's pause. And, further, when, from some unforeseen cause, a train is unduly delayed in starting, or is divided into two or more portions, a special telegraph message is sent to all the principal stations at which it is booked to stop to advise them of the fact, and to enable them to deal to the



best advantage with the local traffic. There are hundreds of other special devices to suit local conditions, but one more perhaps will suffice. By means of electrical instruments called "train describers" (there are several of them), which are fixed at Liverpool Street and are operated from adjacent boxes, the signalmen are advised in advance of every train coming towards them. The advice is, as it were, the natural reply to the anticipated question, "What train is it?" The distinctive bell rings, and step by step the pointer rapidly goes round and then instantly stops, pointing to the correct indication, be it Enfield, Woolwich, Ilford, Loughton, Hertford, Palace Gates, or any other of the numerous trains for which they are provided. Trains will sometimes, following so quickly, get out of course, and this enables the signalmen to know instantly, without asking or any other action of their own, what train it is that is coming, and, therefore, which platform line to put it in. They have simply to raise their eyes to the instrument as the bell rings and act accordingly. And as the trains are approaching the station the home signal for that particular line, which is lowered, indicates to the driver by a number on the arm which platform line he is going to.

We may now, Mr. Editor, with your permission, refer to another branch of the electric telegraph service of a large railway, and it has a great bearing upon the timekeeping and, therefore, the safety of trains. In directing the business and controlling the traffic and promptly dealing with all questions that arise in connection therewith, it is obvious that an extensive and far-reaching system of electric telegraph message work must be necessary. We have on the next page an illustration, from a photograph, of the Liverpool Street Station Telegraph Office.

Radiating from this office there are thirty telegraph message circuits in connection with all the principal stations on the Great Eastern Railway, and a telephone exchange between all the principal offices in the Liverpool Street Station buildings and to Bishopsgate Goods Depôt and all the outlying offices.

There are separate telegraph message circuits from London to Cambridge, to Peterborough, to Norwich (two), to Hunstanton, to Yarmouth, to Lowestoft (two), to Ipswich, to Harwich (Parkeston Quay), and to all terminal suburban line stations and numerous other local electrical circuits, calling at every signal-box and station *en route*; and radiating from every one of these centres are numerous other circuits to signal-boxes and stations in each locality—in fact, a perfect network of wires and apparatus spreading over the whole of the Great Eastern Railway.

The circuit from London to Cambridge, and also the one to Norwich, is provided with more expert apparatus of a higher class—that is duplex double current instruments, which practically duplicate the carrying capacity of each wire. In other words, two messages (one in each direction) can be sent and received on the one wire at the same time without the slightest confusion. The one wire may therefore be occupying four clerks—one at each end sending a message, and one at each end receiving a message.

But the circuit between London and Harwich (Parkeston Quay)—and which practically takes all the message work necessarily arising in connection with the Continental traffic—has its carrying capacity quadruplexed. For this purpose quadruplex double current apparatus is made use of. With this apparatus four messages (two in each direction) are sent and received, on the one wire, at the same time. There are, therefore, eight telegraph clerks fully occupied on this one wire—two at each end sending perfectly distinct and separate messages, and two at each end receiving them without any interference whatever.

The author hopes, Mr. Editor, that he may not be deemed unduly egotistical if he timidly notes that on no other railway in the kingdom is such expert apparatus made use of as that last described. But we have not quite exhausted all the possibilities of electrical science in simultaneously telegraphing more than one message over the same line wire. The duplex and quadruplex apparatus men-

tioned above may only be used at each end of a wire—there can be no intermediate apparatus. Now, by employing an electric current of quite a different character—an induced rapidly alternating current, which by means of suitable apparatus, including a telephone, emits a loud musical or unmusical note—on the ordinary telegraph circuits, whether they have intermediate instruments or not, we may have another and a perfectly independent means of transmitting telegraph messages over the same wire. This is how it is done: On the ordinary telegraph circuits only direct battery currents are employed—in other words, the current given out by a number of cells (similar to those made use of, Mr. Editor, for ringing electric house bells) is transmitted directly to the line wire, and the apparatus employed is all (what is termed) polarised—that is, a current from one pole of the battery moves the needles, or armatures, in one direction, and a current from the other pole moves them in the other direction. The speed with which such currents can be sent to satisfactorily operate the needles, or armatures, is limited to the speed at which the needles, or armatures, can make a complete movement—that is, a dot or a dash. But the current which is to cause the emission of this musical note is transposed in character by passing the battery current through the *primary* circuit of an induction coil; and, by means of a tuning-fork spring, make and break in the *primary* circuit, inducing an extremely rapid alternating current in the secondary wire.

The arrangement is synonymous, Mr. Editor, with the vibratory primary and secondary medical coil. Most people have noticed the noise emitted by this vibrating armature make and break in the circuit of the medical coil. If, instead of taking hold of the handles, they joined the two wires to the two terminals of a telephone receiver a loud, if



INTERIOR OF THE TELEGRAPH OFFICE, LIVERPOOL STREET STATION,
GREAT EASTERN RAILWAY

perhaps unmusical, sound would be emitted. The quicker "the make and break" the higher the note. Now, an electric current of this character, being of extremely high pressure (to use another analogous term), but of comparatively small quantity, will affect a telephone almost, if not quite, as well through what is termed an electrical condenser (we will explain this further on) by induction as if joined metallically and directly to it. A comparatively low-pressure, direct battery current has little or no effect through a condenser of sufficient capacity for our purpose. If now we insert a condenser between this (shall we call it "buzzer"?) apparatus and the line wire of an ordinary telegraph circuit with another

"buzzer" at the other end this will be the effect: The alternating induced electric current from one "buzzer," acting through the condenser, charges the line wire with a similar alternating current, and in consequence of the rapid alternations passes through the ordinary telegraph instruments without affecting them. Their needles, or armatures (as there is mechanical and magnetic inertia to overcome), have not time to respond to each electrical alternation; or, in other words, each rapidly succeeding alternation, being of opposite phase, neutralises the effect of the preceding one before mechanical motion can take place. Such an electric current, therefore, may pass through the ordinary telegraphic apparatus with impunity. But as it acts through the condenser at the other end a loud sound is emitted by the telephone receiver there. The direct battery current does not affect the telephone through the condenser.

A condenser, Mr. Editor, may be looked upon practically as two very large surfaces of metal, such as tin-foil, with a wire attached to each (but the metal plates separated, so that they do not actually touch each other, by a sheet of oiled or waxed paper or thin mica), and therefore a suitable electric current used to charge one plate does not actually pass directly to the other plate, but induces a similar charge or current of electricity in it or on it, and therefore to the wire attached to it. The magnet or self-induction resistance, which is also used, is purposely not mentioned, as it might tend to confuse the ordinary reader. On the ordinary telegraph circuit to Ipswich (with intermediate telegraph instruments) one of these alternating "buzzers" is fixed at London, another at Colchester, and a third at Ipswich—just as effective as if we had erected another wire, giving these three stations independent communication.

Similar apparatus is in use between Cambridge, March, and Peterborough on the ordinary London-Peterborough circuit; between Norwich and Lowestoft on the London-Lowestoft circuit; and between Cambridge, Ely, and Lynn on the London-Hunstanton circuit. This gives all the principal stations

direct through communication with each other, without the interference of the smaller intermediate stations; while they also retain, by the ordinary telegraph instruments, direct communication with the smaller stations lying between them. And then, as each race week comes round and an extra telegraph clerk goes down to Newmarket to deal with the extra work, he takes with him a portable set of this apparatus, and he has merely to join on the line wire (he requires no electrical assistant with him), the battery wires, and the earth, and he has direct communication with London, a spare instrument always being kept at the latter place connected ready for use. But there is no ordinary telegraph circuit between London and Newmarket, and therefore at Cambridge (the junction) this alternating electric current by means of another condenser passes from one line wire to another (it is really induced in, not conducted to, the other) and thence direct to London. This skipping from one wire to another is, no doubt, all very strange to the general reader, but perfectly simple and reliable. It gets there all the same.

For testing purposes every telegraph line wire, the instrument wires for every instrument, and the battery wires, too, are led into a test box, to which also the necessary testing instruments are led. A reduced photo of it is given on next page.

Altogether there are on the Great Eastern Railway over 8,000 electrical instruments of different kinds—nearly 45,000 battery cells and nearly 10,500 miles of wire, including many miles maintained for the Postmaster-General.

At two minutes to ten every morning all message work is stopped, the attention of all stations is peremptorily demanded by Liverpool Street (the principal stations similarly deal with the smaller stations and boxes in their locality), and as the "time" signal is received from Greenwich through the General Post Office at 10 o'clock *by the operation of one instrument at Liverpool Street*, time is instantly and simultaneously sent over all electrical circuits throughout the length and breadth of the Great Eastern Railway.

In dealing with the telegrams at Liverpool Street Station the arrangements are also quite up to date. All telegrams from the Telegraph Office to the General Offices, to the Goods Offices, to Bishopsgate Goods, and to the two Telegraph Receiving Offices on the platforms on the east and west sides of the station are collected and delivered by pneumatic tube.

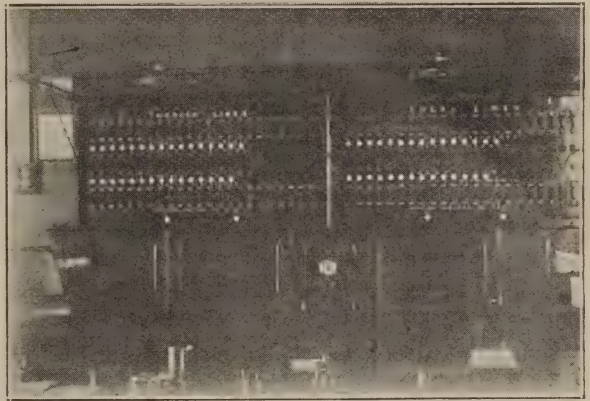
A number of telegrams are rolled up together and placed in a small tubular carrier, and being held securely therein by a broad elastic band across the open top, they have simply to be placed in the pneumatic tube, the slide closed, a small lever turned, and in a few seconds, preceded by an electric bell signal and a visual electrical indication that a carrier is coming, they are at the other end. The pneumatic engines are constantly going, day and night—one engine to keep up the pressure and another to keep up the vacuum—in two large outside reservoirs or accumulators. As a matter of fact, the pressure engine is automatic, and stops immediately the pressure rises to the maximum, and as the pressure becomes reduced by working, the engine again starts to raise up the pressure. The control of the system is in the Telegraph Office, and some of the apparatus may be seen on the left in the illustration of that office (page 133). The engines themselves are about half a mile away.

By turning the little lever on the counter beside each pneumatic box in one direction the *pressure* is turned on to *blow* a carrier through; and when the lever is turned in the opposite direction the carrier and its contents are *sucked*, as it were, from the other end by the *vacuum* applied to the tube by the lever closing the *pressure* connection and opening the *vacuum*.

One clerk is constantly employed in operating the pneumatic tubes in the Telegraph Office, and in the middle of his counter is a compact telephone and switch to enable him to instantly communicate with the clerks at the other end of each of the five tubes, and

to the engine-driver of the pneumatic engines and to the telegraph linesman in case of emergency.

Feeling how utterly impossible it is to describe or even indicate a tithe of the remainder of the interesting electrical apparatus in daily use in the electrical department of a large railway, the author feels that, having dealt with this efficient method of delivering telegrams, he may treat this final operation of telegraphic work as a suitable point at which he may leave off whilst his subject—and, he trusts, the patience of his readers—is



INTERIOR OF LIVERPOOL STREET TELEGRAPH OFFICE TEST-BOX, ETC.

still not *quite* exhausted. Seeing that the problem, "What is it?" as regards electricity still remains unanswered, and conning over the vast achievements of electrical science—turning night, as it were, into day, transferring power over long distances, which without it would be absolutely impossible, available alike in the cottage and the palace, on the field of battle and in the more peaceful realms of commerce—it may not, perhaps, inaptly be said—

By silken threads enchain'd in convolutions,
Her mystic force the will of man obeys;
Each part fulfilled means silent revolutions,
A monument in our Creator's praise.
And still her light undimmed, more wonders
planning;
Her power colossal; still *herself* unknown;
Her aids to science, other secrets scanning—
Electra, still, does not disclose her own!



"THE RUTHERFORD RAIDERS"

By D. T. TIMINS, B.A.

(Concluded.)



SO far so good. But it was another ten days before the details of the scheme were anything like settled, and another week again before the opportunity arose for embarking on our desperate venture. To substitute our roulette board for one of those actually in use seemed to be a physical impossibility. The Casino is well guarded at night, and of course during the day we were powerless. But one Monday morning saw the announcement published of a *grande redoute* to take place in the Casino Theatre on the following Friday. Mortimer resolved to attend this dance and try to conceal himself during the evening in one of the dressing-rooms at the back of the stage. When the ball was over and all was quiet he intended to enter the gambling rooms by means of a skeleton key and to substitute his prepared roulette board for the one upon the table patronised by the Prince. This done he was to make his escape through one of the windows, and our grand coup was to be attempted the following evening. It seemed a desperate idea, more especially as it now became necessary to make the roulette board portable, in order that Mortimer might conceal it about his person. However, by our united efforts we overcame that difficulty, the top and bottom being separated so that they could be worn by Mortimer back and front under his shirt, whilst the revolving arms were jointed and similarly hidden. Meantime, we despatched Ryland to Paris, and ourselves shadowed Alphonse Minaud, the croupier.

"Ryland's task was a difficult and dangerous one—in fact, I do not remember to have ever entered upon an adventure demanding such tremendous care, resourcefulness, and skill from all concerned in it. The slightest slip meant failure.

"It was the custom for Smith's Bank to receive their mail daily in a large padlocked basket—similar to those used for parcel post traffic in England. As they were by far the largest bankers in the South of France, and the Monte Carlo post-office was then a very primitive shanty, it had been arranged that all letters from their Paris house, together with transfers of bullion (in a safe, of course), should be placed in this basket by a representative of the firm. After passing through the Paris post-office it was taken straight from the mail train reaching Monte Carlo at 2.45 p.m. to Messrs. Smith and Co.'s bank. On Saturday, owing to the earlier closing of the bank, a clerk was told off to await the arrival of the mail basket and lock it up in the strong-room. This done he went home, leaving the bank in charge of the watchman, and the basket was never opened until the following Monday morning.

"We directed Ryland to be at the Gare de Lyon on the Thursday night one hour before the departure of the 8.25 p.m. *rapide* to Vintimille, and to reserve a compartment for himself next to the mail van. When the train entered the tunnel between Aubagne and Cassis it was Ryland's duty to crawl along the foot-board, overpower the man in charge of the mails, and open the lock of Messrs. Smith's mail basket by means of a skeleton key. As the train does not stop again until reaching

Toulon, and there are numerous tunnels, he would have no difficulty in throwing the contents of the basket out of the window.

"This done, he was to get into the basket himself and cut a small slit in the front, through which he could re-fasten the padlock. If it were necessary to kill the conductor he must so manage that it would seem as though



"To reserve a compartment for himself next to the mail van"

his victim had committed suicide. If, however, Ryland could render him insensible with chloroform so much the better. The fact of the mails appearing to be intact would probably cause motives of revenge to be assigned to the assault. Ryland's compartment being found empty upon the arrival of the express at Toulon, it would be assumed that he had jumped from the train. They would never dream of his being actually concealed in the mail van.

"The weight of the basket at Monte Carlo would excite no suspicions, the *facteurs* there being accustomed to finding it excessively heavy when containing the bullion safe. Once ensconced in the bank Ryland could

easily overpower the watchman and receive the money from the Casino himself that evening, joining us with the spoil an hour later.

"We quickly discovered that the croupier Minaud was carrying on an *amour* with a very pretty little dressmaker, whose place of business was situate at the top of the town close to the new 'La Turbie' station, then in

course of construction. Hitherto Adèle, for such was her name, had not smiled upon her devoted admirer, and Alphonse was in despair. He would take poison, he declared; he would hurl himself into the sea; he would go mad if his *chère* Adèle remained obdurate. But Adèle only shook her black ringlets and looked bewitchingly out of the corners of her dark eyes, the while she declared that she could never—no, never—marry a man connected with that horrid Casino! Think of the suicides—ugh! And Adèle elevated her pretty little nose and smiled distractingly upon the *boulangier* opposite until her croupier lover was in the depths of despair.

* * * * *

"Late upon the Friday night which had been fixed for the *grande redoute* Minaud received the following note:—

Meet me in the wood at the back of the Bordina Hospice, where the Ste. Dévote road crosses the Vieux Corniche pathway, at 6.30 on Saturday evening. Do not fail me, as it is a matter of life and death. You are not on duty at the Casino until 7.0, so you will have plenty of time. If you do not come you will never see me again.

ADELE.

* * * * *

"My own particular duty in connection with our enterprise consisted in breaking into the contractor's shed containing the tank locomotive which was being used during the con-

struction of the Monte Carlo La Turbie railway, and getting steam up by twelve o'clock midnight on Saturday. The line was not finished, but was nevertheless laid with temporary rails right up to La Turbie. Pursuit would be impossible. We could reach the top in thirty minutes, whilst, even if anybody could be found willing to climb the heights above the Sainte Dévote valley in the dark, the ascent must occupy at least two hours.

"The fateful night came, and a brilliant scene did the Casino Theatre present. Striking uniforms mingled with the latest creations of Parisian dress-makers, and all was glitter and animation. Towards the middle of the evening I missed Mortimer, and it was with a feeling of exultation that I retired to our room to smoke cigarettes until he returned—if he ever did so!

"Morning came without any sign of his appearance, and it was noon before he walked unconcernedly into the smoking-room of the Hotel de Paris, of which I was the sole occupant.

"Of course it wouldn't do for me to come back in the middle of the night,' said Mortimer, upon my expressing surprise at his late appearance. 'If they suspect anything they'll make inquiries, and my movements would at once look queer. I fixed the board all-right, and then managed to get out through a window, as I expected I should do, but I had to tap a sleepy soldier somewhat hard and unexpectedly on the head before I felt safe,' and he laughed grimly.

"Well, we've done all we can now,' I said. 'The workmen leave at five to-night on the La Turbie line, so I shall go up there about 5.30 and see that everything is ready. I suppose I can leave Minaud to you?'

"Oh, yes!' replied Mortimer, sardonically. 'Another little tap will quiet him, and I can ensure his not waking for at least twelve hours!' And he significantly drew a small hypodermic syringe from his pocket.

"The day passed uneventfully, save for a telegram from Ryland, dated Marseilles, announcing that he had secured the necessary compartment in the 8.25 p.m. *rapide*.

"I experienced no difficulty in entering the contractor's shed and making all necessary preparations for our flight. There was no one in charge, plenty of coal and water on the engine, and a carriage was also in the shed.

"I am not given to nervousness, as you know, my dear Walter, but it was with a slightly suffocating feeling at my throat that



"I experienced no difficulty in entering the contractor's shed and making all necessary preparations for our flight"

I entered the Casino about 7.45—fifteen minutes in advance of the Prince. He had dined as usual, and thus dispelled the great fear that we had entertained that after all some unforeseen accident might prevent him from gambling that night and so stultify all our carefully laid plans.

"One glance at the first roulette table was

sufficient. Mortimer was seated there spinning the ball and calling out the winning numbers as unconcernedly as though he had been a croupier all his life. Evidently there was no suspicion on the part of the Casino officials that it was not Minaud himself; and, indeed, his likeness to that individual was positively amazing, whilst, as regards his clothes, he was wearing the very garments of the unfortunate croupier.

"At this moment the Prince entered, and, amidst a slight stir among the onlookers, quietly took his accustomed seat.

"I will not weary you with an account of the evening's proceedings. Suffice it to add that, after a very few spins, all doubt as to whether or not by some mischance the 'faked' board had been removed to another table were laid at rest. Not being under the necessity of sometimes letting our victim win, as is the case in most affairs of this kind, the croupier steadily raked in his bank notes. Ten o'clock found the Prince flushed and angry, and compelled for the third time to send his attendant to the hotel to fetch some more money. He had already lost the enormous sum of 600,000 francs!

"A whisper had gone round the room that the Prince's run of luck had changed in a most extraordinary fashion, and a huge crowd was gathered round the table. But with the persistency of the true gambler Ferrand continued to stake in maximums, as he had done throughout the entire evening. And still Mortimer spun the ball with an impassive countenance, and not even I could detect the motion by which the switch was altered.

"At 10.30 I left the rooms and hurried once more to the 'La Turbie' railway works. I lighted the fire in the contractor's little engine, for it was necessary to get up a good head of steam before attempting the three-mile climb.

"It was a weary wait, crouching on the diminutive foot-plate with a loaded revolver in readiness, for the first visitor might easily be a police officer.

"All seemed quiet in the town, however. At last I was forced to open the safety-valve, dangerous though it was to do so. The steam

had hardly commenced to escape when I heard through its hiss the tramp of laboured footsteps, and Mortimer and Ryland made their appearance, carrying a small but heavy sack.

"'Right away—quick, now!' said Mortimer, as they with difficulty lifted their burden into the small truck.

"I opened the regulator, Mortimer sprang on to the foot-plate, and Ryland on to the top of the sack. We drew slowly out of the shed, and the little engine commenced pantingly to ascend.

"Owing to the weight she was drawing it was a difficult business to make the sturdy little locomotive climb up those terrible gradients, even helped as she was by the rack rail, and once or twice when the wheels slipped I thought it was all up with us.

"Often did Mortimer step off the foot-plate to strew the ground thickly with small capsules of concentrated nitro-glycerine, so that in the event of any pursuers attempting to utilise the railway track they would meet with a terrible check!

"La Turbie reached in safety, we transferred ourselves and our booty to a post-chaise drawn by four horses, standing in readiness on the Corniche road, and dashed off inland in the direction of Digne.

"Not until then did we find time to talk matters over. Mortimer had duly met Minaud in the wood, surprised and stunned him, injected morphia-cocaine, causing prolonged insensibility, and exchanged clothes. This done, he hurried to the Casino, being admitted by the officials without challenge. The Prince finished up a loser of the enormous amount of 1,200,000 francs! The scene at the end Mortimer described as extraordinary.

"Ryland had done his part well. Entering the mail van in the Cassis tunnel, he found the man in charge asleep, and had no difficulty in chloroforming him. He described his experiences in the mail basket as highly unpleasant. The bank watchman he was obliged to stab. At 11.45 the unsuspecting soldiers duly handed in the Casino money to him. He and Mortimer did not meet a soul on their way to the shed, and there was no reason to

think that anything would be discovered until the following morning.

"Near Puget-Theniers I quietly lifted our driver off the box and once more requisitioned the hypodermic syringe. We left him sleeping peacefully in a thicket.

"At Digne we separated, and the money, amounting to about £300,000 sterling, was given into my charge for conveyance to England.

"My plans were already made, and two days later I stood on the platform at Livron Station *en route* for London, having travelled *viâ* Vegnes and St. Auban. Our booty, represented now by several rolls of notes, was stowed away on my person. It was 6.15 p.m., and in one hour a special train, consisting only of an engine and a saloon carriage conveying the Queen's Messenger from Narbonne to Calais, was expected to pass. Until this train had cleared Livron Station the ordinary 7.5 p.m. thence to Paris, by which I intended to travel, would not be allowed to proceed. To while away the time I bought a French paper, and turned to the page containing the 'Latest news by telegram.' The first paragraph ran:—

"Casino Robbery! Further developments! The driver of the post-chaise has now been found near Puget-Theniers. From his account it is conjectured that the robbers planned to reach the P. L. M. railway somewhere near Grenoble, and thence make their way on to the main line. The strictest watch is being kept at all stations north of Lyons, and it is impossible that the miscreants can escape."

"This was startling news! It was necessary to act, and at once! My minute knowledge of railways enabled me to formulate a plan of escape. Livron Station was deserted, no train being due for some time, and, under cover of the darkness, I made off down the line. Two miles from Livron the track plunges into a cutting, and there is a signal post just out of sight of the cabin from which it is worked. Mounting this post by the aid of the lamplighter's ladder, and clinging to the semaphore in a rather perilous position, I managed with a diamond to cut a square of

red glass out of the 'spectacle.' This done, I opened the lamp and placed my red glass in front of the flame. The signal would now permanently block the line, no matter how hard the signalman might haul at his lever. I then hurriedly scribbled a telegram on a stolen 'service' form, and, pulling my cap over my eyes, walked to the signal-box and handed the message to the signalman. He read it through without a suspicion as to its genuineness, and, with a gruff '*Bien,*' turned to the Morse instrument. The message ran as follows:—

"To the Chef de Gare,

"Lyon-Perrache.

"Special train Narbonne to Paris to travel *viâ* St. Germain-des-Fosse and Montargis, not *viâ* Dijon.

"BUREAU DE CONTROLE, MARSEILLE."

"Having satisfied myself that my telegram had been duly despatched, I withdrew and hid myself among some bushes close to the paradoxical signal. It well merited that adjective, for, though the semaphore arm was raised vertically to safety, the lamp proclaimed 'Danger'!

"I had not long to wait. I soon heard the whistle of the special express in the distance and the grinding of the brakes as the driver sighted the treacherous signal. The train drew up close to the spot where I lay concealed. After a halt of some minutes the guard got down to hold colloquy with the driver as to the reason for this extraordinary delay. Slipping from my concealment, I crawled flat along the ground to the rear of the train, and, climbing to the roof of the guard's van by means of the carriage-cleaners' steps, stretched myself at full length behind one of the huge gas cylinders which are always placed on the roof of the P.L.M. Co.'s coaches. The night was pitch dark, and from the ground I was absolutely invisible. It was nearly half an hour before the train proceeded on its way, and for the previous fifteen minutes I could hear the signalman angrily arguing with the engine-driver.

"I hung on to the roof like grim death, for we rocked fearfully. To my great relief we

ran through Lyon-Perrache Station, but at Lyon-Vaise we stopped, doubtless in order that the driver might receive his fresh instructions. However, the station was unlighted, and after a very brief stoppage we started again.

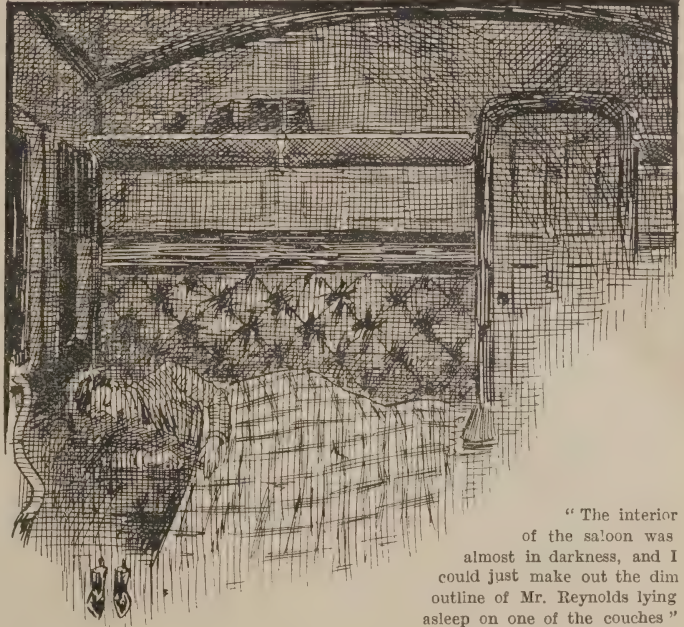
"I lay quietly in my place of concealment until we had passed Roanne (which we did at full 60 miles an hour) and entered the St. Martin d'Estreau tunnel. I then made a hazardous expedition to the roof of the saloon and descended to the footboard. Nothing but my great strength and iron nerve prevented me from being shaken off the train altogether. The interior of the saloon was almost in darkness, and I could just make out the dim outline of Mr. Reynolds lying asleep on one of the couches. Climbing in through the window, I had gripped him by the throat before he was even aware of my presence.

"See here!" I said, as he gazed at me, unable to move in my grasp and with his eyes dilated with terror; 'I mean you no harm if you do as I tell you. I simply intend to ride in this train until we reach Montargis. I shall conceal myself under that couch opposite. If you give a word or sign or attempt to call for help at any of the intermediate stops I will shoot you!' I held my revolver to his head as I spoke in proof of my *bonâ fides*.

"Of course the wretched man had no alternative but to swear, as I required him to do, that he would not betray me; so, after taking the precaution of tightly binding his wrists and ankles with his own luggage straps and of drawing his rug right up round him in order to prevent anyone from noticing that he was tied up, I proceeded to assume a comparatively unobtrusive position beneath the couch. However, no one came to the saloon at Nevers, which was the only stop we made,

and Reynolds made no attempt to call for assistance. Perhaps the gleam of my revolver barrel, which was perfectly visible to him, may have had a stimulating effect upon his fidelity!

"As we approached Montargis and plunged into the pine woods near that town, I came out from my concealment and pulled the alarm



"The interior of the saloon was almost in darkness, and I could just make out the dim outline of Mr. Reynolds lying asleep on one of the couches"

bell hard. The train instantly began to slow up, and, as soon as I dared, I jumped out, alighted without injury, and, running down the embankment, made off through the woods under cover of the darkness.

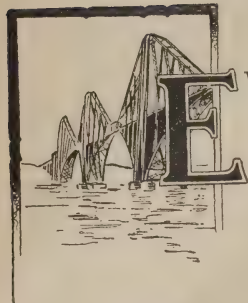
"My various ruses were successful. The non-appearance of the special train at Dijon caused the utmost alarm. The extraordinary story told by Mr. Reynolds upon his arrival in England and the mysterious affair of the signal inclined the superstitious French officials to believe that some supernatural agency had been at work, and no connection was ever traced between the Casino robbers and the Queen's Messenger's strange companion.

"From Montargis I dodged to Cherbourg over small branch lines and reached England without further adventure."



TANK ENGINE EXPRESS TRAINS

By J. F. GAIRNS



EVERY railway enthusiast, and indeed a large proportion of the travelling public, is familiar with the crack trains of England; knows all about the long runs

without stopping of the Great Western Railway to Exeter, London and North Western Railway to Crewe, Midland Railway to Nottingham, Great Eastern Railway to North Walsham (Cromer express), and others; is well up in all the details of the 1888 and 1895 racing trains to the North, and the magnificent closing West Coast run to Aberdeen, and can tell you the chief particulars of the locomotives running such trains. But to a very large proportion of these people the absence of a

tender and the provision of side and bunker tanks cause the loss of all interest. To them tank locomotives are only fit for slow and short-distance trains. They are useful locomotives, and their trains are indispensable, but very little interest is taken in their performances. But as the suburbs of

London extend further and further an increasing number of fast suburban trains are run, each having fewer stations allotted to it, and very many creditable trains are hauled by tank engines (often bunker first) at speeds

rising in some cases above the old express standard of forty miles an hour, and warranting the title of "Tank Engine Express Trains."

I will first give a few particulars of tank engine express trains whose average for the express portion of their journey (for such trains are very often stopping trains after a certain distance) is above forty miles per hour.

The best performances of this kind of which I am aware are found on the Great Western Railway—24 miles in 33 minutes, start to stop, is very creditable indeed. There are several of these trains which run express from Paddington to Maidenhead, and then stop at all stations on the High Wycombe branch. The trains are not particularly heavy, the engines are not particularly new. They are, moreover, not specially adapted for the work, and are identical with those working Great Western



Photo by]

FIG. 1.—GREAT WESTERN RAILWAY TANK ENGINE [F. Moore
Cylinders, 16in. diameter, 24in. stroke; coupled wheels, 5ft. diameter.
Fitted with condensing apparatus

trains on the Metropolitan and Metropolitan District Railways. They are, further, not provided with a cab, but simply a weather-board. The Windsor expresses are also run by these engines, performing the journey to Slough

($18\frac{1}{4}$ miles) in 24 or 25 (sometimes 23) minutes, giving average speeds of 45 or 46 miles an hour, and for the greater portion of their journey speed ranges well up to and over 50 miles an hour. Here again the trains are not particularly heavy, and the road is not hard; but, notwithstanding, they are very fine trains, and do great credit to the engines drawing them.

Fig. 1 illustrates one of these engines, and some particulars are as follows:—Driving wheels, 5ft.; leading wheels, 3ft.; weight in working order, 33 tons; cylinders, 16 by

Tilbury and Southend Railway. Here 35 miles 66 chains are run in 50 minutes, including a stop at Westcliff, on the outskirts of Southend. This train originally left Fenchurch Street at 5.5 p.m., and before the abolition of the second class was limited to first and second class passengers, but has for some years left Fenchurch Street at 5.15 p.m., arriving at Southend at 6.5 p.m. Since the opening of the new station at Westcliff it has also stopped there at 6.2, without any additional time allowance. The average speed is 43 miles per hour. It is, moreover, very much hampered

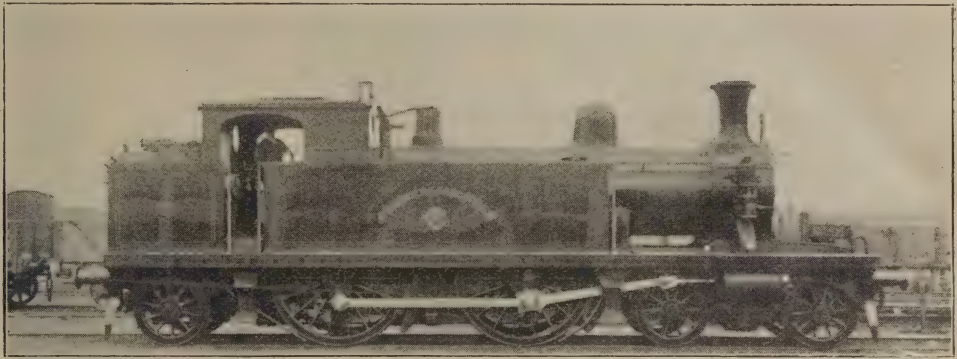


Photo by]

[F. Moore

FIG. 2.—LATEST TYPE OF LONDON, TILBURY AND SOUTHEM RAILWAY TANK ENGINE

Coupled Wheels, 6ft. 6in. diameter

24in. There are also a few newer engines very similar, but coupled in front and provided with a cab, though a somewhat scanty one.

The 4.15 p.m. up Windsor express, the engine of which broke a connecting rod last summer when running at full speed near Acton, resulting in the death of the driver and fireman, is only allowed 24 minutes between Slough and Paddington ($18\frac{1}{4}$ miles), and is usually worked by these engines, although on the occasion in question a six coupled goods tender engine was working the train.

No other railway uses engines of so small and obsolete a type on trains timed at such high average speeds, and in fact there are very few instances on other lines of trains at such high speeds even when worked by larger and more suitable engines.

The next run which I will consider is that of the Southend express on the London,

for the first $2\frac{1}{2}$ miles, while on the Great Eastern Railway, and no one who habitually observed it, as I have, on that portion would consider it easy work to keep time. Seven or eight minutes for the first $2\frac{1}{2}$ miles is not at all uncommon, but the train has nevertheless a very good reputation for punctuality. The up morning express at 9 a.m. almost invariably arrives at Fenchurch Street at 9.50 to the minute. The road is not particularly hard, with the exception of the long bank of about three miles near Laindon. But this is balanced, for both up and down trains, by corresponding down grades to East Horndon and Pitsea, of which full advantage is taken. It is also uphill from Leigh into Southend. This Company also run several trains performing the journey in an hour, and making three additional stops.

The locomotives are large ten-wheeled tanks

having outside cylinders, and Fig. 2 shows one of the latest of these. The principal dimensions are: driving wheels 6ft. 6in., bogie and trailing wheels 3ft. 6in., weight in working order 63 tons, cylinders 17 by 26 inches. The older engines are of similar design, but the wheels are only 6ft. 1in. in diameter, and weight 55 tons. Either class of engine is quite

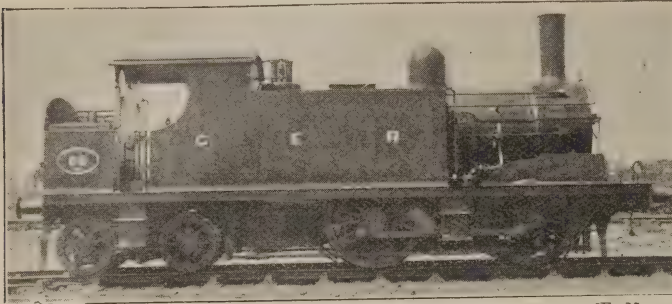


Photo by]

[F. Moore

FIG. 3.—GREAT EASTERN RAILWAY 4-COUPLED-IN-FRONT TANK ENGINE

Driving Wheels, 4ft. 10in. diameter

capable of running the trains to time, but the 6ft. 6in. engines are usually employed on the 50 minute expresses, although on the other trains they work turn and turn with the older engines.

The Great Eastern Railway make very good use of tank engines, but their average speeds are not so high as in the above instances. The 2.15 p.m. from Liverpool Street to Bishop's Stortford, slipping at Waltham Cross on Saturdays and stopping other days, performs the 18 miles to Broxbourne in 30 minutes. Here again the train is not heavy, but there is the Bethnal Green bank to climb at starting, and high speed cannot be attained until Tottenham is passed. The engines running this train are rather old (see Fig. 3), and are usually of the front-coupled type with trailing bogie. Driving wheels 4ft. 10in., bogie wheels 2ft. 10in., weight 46 tons 17 cwt. Some of these are petroleum fired.

Other good runs by this Company are made on the 9.47 a.m. train (summer only) from Fenchurch Street to Southend (G.E.R.). This train stops at all stations to Ilford, and then only at Wickford and Prattlewell, and the 21½ miles from Ilford to Wickford

are run in about thirty minutes, this including the long pull up Brentwood bank and a slack through Shenfield Junction. Speed ranges with this train well above 50 miles an hour, and short stretches are run at quite 60 miles an hour. The load is, however, very light, being generally only about 10 four-wheeled vehicles.

The locomotives are of the 1070 class of main line tank engines (see Fig. 4). Driving wheels 5ft. 8in., leading and trailing wheels, 4ft., weight 58 tons 12 cwt., cylinders 17½in. by 24in. These engines also do very good work on a variety of trains working to Southend, Chelmsford, Loughton and Ongar, Broxbourne, etc. No. 1085 (illustrated) is also fitted with the condensing arrangement for working in tunnel.

The 5.55 p.m. from St. Pancras is run by these, and stops at Kentish Town, South Tottenham, Waltham Cross, Broxbourne, and thence to Hertford, doing some very fast running between stations, notably between South Tottenham and Waltham Cross.

The 9.15 a.m. train from Liverpool Street to Ongar stops only at Stratford between Liverpool Street and Woodford, and the 9.47 a.m. from Ongar stops only at George Lane between Loughton and Bishopsgate, being allowed 24 minutes for the 12 miles. This train, moreover, runs very fast to Stratford to allow for the usual delays there, and on to Liverpool Street. Both of these trains are run by the 1070 class, above mentioned, although occasionally engines of the 650 and 791 classes are employed. These engines were the predecessors of the large 1070 class, and are of substantially the same type, but somewhat smaller, the driving wheels being only 5ft. 3in. diameter. Also the 4ft. 10in. engines shown in Fig. 3 have on several occasions run these trains.

On the London and North Western Railway some very good work is performed by tank engines. The 8.10 p.m. from Euston performs

the 17 miles to Watford in 27 minutes, including a 2-minute stop at Willesden Junction. The 5.23 p.m. from Broad Street arrives at Sudbury at 5.46. A number of slow main line trains stopping at Willesden Junction, Harrow, and Watford are run by these engines, and actual speeds of 45 and 50 miles an hour are usually attained by them. They are of the double-ender type (see Fig. 5), driving wheels 5ft. 6in., weight 50½ tons, cylinders 17in. by 24in. These engines are noticeable for the roominess of the cab, but there is practically no side protection, and this the drivers find very trying in bad weather. A similar class, but with wheels only 4ft. 6in., are also employed, and on the Broad Street fast trains to Watford six-coupled engines with a trailing radial axle are sometimes to be seen.

So far as regards tank-engine trains on other railways, the London and South Western Railway runs a number of fast trains to Richmond, and on the Windsor line, in addition to many of their slow main line trains. The 2.29 from Waterloo runs to Surbiton, where the train is divided (often with two tank engines)—12 miles in 23 minutes.

The London, Brighton and South Coast Railway make good use of their tank engines, and there is a tradition of the down 5 o'clock Pullman to Brighton having been run by a tank engine to time, but I have no definite information on this point.

Some years back it was not unusual for tank engines to run some of the trains between London and Brighton, which stop only two or three times, and this occurs occasionally now.

On the South Eastern Railway tank engines run to Dartford without stopping, and to East Croydon, and I am informed that the 9.22 a.m.

from Gravesend is run by a tank engine, performing the 22 miles in 36 minutes. Some of the fast main line trains between Dover and Ashford Junction are hauled by tank engines upon occasions when the train (or tender) engine brings in the Margate portion of the train to Ashford.

The London, Chatham and Dover Railway run their Crystal Palace "expresses" (?) with tank engines, but there is nothing extraordinary about these trains, and it is a matter of wonder where the "express" comes in, especially as this Company make a distinction on their time-tables between fast and express trains. Some of their fast local trains attain very fair speeds. The Great Northern Railway and Midland Railway do not run any trains with tank engines of special notice so far as I have been able to find out.

The Metropolitan Railway run their Aylesbury trains fast to Harrow, stopping in some cases at Willesden Green, and there were recently several fast trains between Aylesbury and Verney Junction.

It will be seen from the above that most companies use tank engines fairly generally,

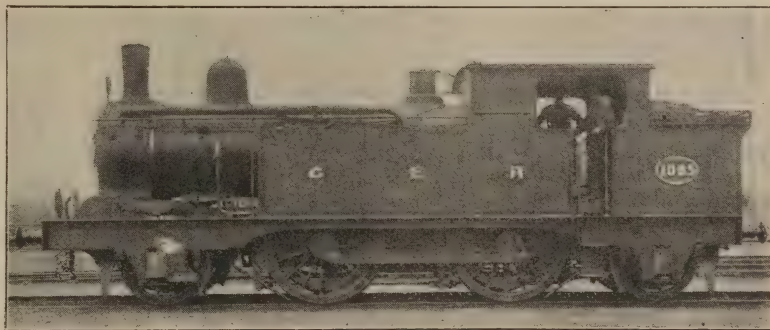


Photo by]

[F. Moore

FIG. 4.—A GREAT EASTERN RAILWAY "DOUBLE-ENDER" TANK ENGINE, FITTED WITH CONDENSING APPARATUS

and that in many cases good averages and high speeds are required of them. This is especially so as their work is rather to be compared to that of mixed traffic, or small-wheeled tender engines, than to express tender engines.

The Great Western Railway must take first

place as regards high average and actual speeds for their tank engines, and the London, Tilbury and Southend Railway for length of run combined with high average and still higher actual speeds, but in their case the locomotives are almost entitled to rank as express engines, owing to their great size and the large diameter of the driving-wheels.

That tank engines can work these trains (notwithstanding the adverse opinions expressed by engineers and others as to their being unsafe at high speeds), and do so satisfactorily, is an acknowledged fact. This, com-

bined with their suitability for local work, and there being no necessity for turning them, makes them a most useful class of engine, and

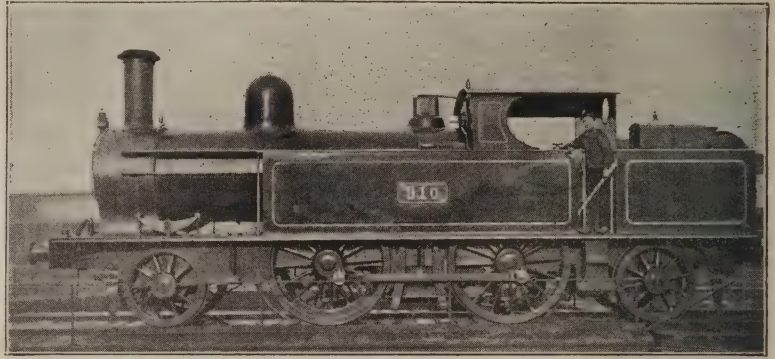


Photo by]

[F. Moore

FIG. 5.—LONDON AND NORTH WESTERN RAILWAY 8-WHEEL TANK ENGINE

Driving Wheels, 5ft. 6in. diameter.

there appears to be a growing tendency for the more general use of tank engines in preference to tender engines.



AT CREWE

THERE was a young lady in blue,
 Who wanted to catch the 2.2;
 Said the porter: "Don't hurry,
 Nor scurry, nor flurry,
 It's a minute or 2 2 2.2!"

A RAILWAY IN ARGENTINA

By W. H. DYKE



THOSE of our readers who have never had occasion to visit the "Silver Land," or to inquire, more or less, into the resources and conditions of life of its inhabitants, will probably feel an interest—perhaps not unmixed with surprise—in glancing over the following brief account of one of the most notable enterprises, inaugurated and maintained by British capital and directed and worked by men principally of that nationality, existing to-day on the shores of the River Plate.

The Buenos Aires and Rosario Railway is the second longest in the Argentine Republic, possessing 914 miles of line, against 845 miles worked by its nearest competitor, the Central Argentine Company.

The Rosario Company was formed in London in the year 1873, with a capital of £1,100,000, to take over a concession obtained from the Argentine Government by a Mr. Matti for the construction of a railway from Buenos Aires to the Port of Campana, a distance of about fifty miles. The title of the undertaking was then "The Buenos Aires and Campana Railway," but when it was subsequently found desirable to extend the line to Rosario—communication between that city and Campana having for some years been conducted by means of steamers running in connection with the trains—its name was changed to that by which it is at present known.

It was soon found that further developments of the system could with advantage be made, and the necessary authorisation was procured for the extension of the line to Sunchales, and afterwards to Tucuman, which is the chief

town in the "Garden of the Republic," and is situate 718 miles from Buenos Aires. On reference to the map on page 148 it will be seen that, in addition to the trunk line between the two points named, various branches—notably those to the Tigre, Morteros, Santa Fé, and to a number of sugar factories in the north—have been constructed, thus bringing up the total mileage to the above-mentioned figure.

The policy of the directors has always been energetic and advancing, and, in order to keep pace with the demand created by the execution of works considerably in excess of those originally contemplated, the share capital has from time to time been increased, until it now stands at the amount of £6,000,000.

Before leaving this part of the subject it may be mentioned that the existing title of the Company is still somewhat a misnomer, inasmuch as the main line is carried beyond Rosario for no less than 530 miles, while the distance between that point and Buenos Aires is only about 188 miles, or a little more than a fourth part of the total length. The railway is, in fact, the Grand Trunk line from the capital of the Republic to the northern provinces, and, although it naturally has many rivals, none can approach it in regard to directness of route and rapidity of service.

For many years this Company's trains started from the Central Station in Buenos Aires, whence they ran for $2\frac{1}{2}$ miles over a line, primarily constructed by the Northern Railway, as far as Palermo Chico Junction; but since the destruction by fire in 1897 of the Central Station the southern terminus of the Rosario Company has been Retiro, a locality remote from the principal business parts of the city, and consequently not so convenient

simply monotone the destination of the train, with announcements of the principal stations *en route*, and the travellers do the rest of the shouting. Presently a whistle is heard; then another, a bell is sounded, more whistles follow, a hoot from the engine, and we are off.

Perhaps the first thing noticeable is the



NEW RAILWAY VIADUCT AT BUENOS AIRES, SHOWING THE HIPPODROME
HIGH LEVEL RAILWAY STATION IN COURSE OF CONSTRUCTION

extremely easy motion of the train, which, even when it has attained a comparatively high speed, glides along smoothly and comfortably, with hardly any perceptible jolting or rocking. This is attributable partly to the well-constructed and evenly-balanced rolling stock and the carefully-maintained permanent-way, and partly to the fact that we are on a "broad-gauge" line of 1.676 metre (5ft. 6in.) width, adopted by the principal railways, as opposed to the 1 metre "narrow gauge" of others.

As we have stepped on to the rear platform of the tail coach, where, although it is a convenient location for smoking a cigarette and watching the rapidly diminishing signal and other lights of the city, passengers are not allowed to remain, we will wend our way to the fore part, hastening, for the sake of our olfactory nerves, through the crowd of garlic-eating, orange-sucking, black-tobacco-loving individuals by whom the second-class carriages are occupied. In passing we observe that a

small tank of drinking water and lavatory accommodation are provided in each of these cars. We soon arrive at the first-class coach, in the leather-cushioned saloon or cosy compartments of which, however, we will not stay, but will proceed until we reach the restaurant.

Here, indeed, is the acme of comfort—not to say luxury—in railway travelling. Brilliantly illuminated by gas, as are all the other vehicles, it presents a dazzling and alluring sight. The artistic decorations, glistening mirrors and crystal-ware, spotlessly clean and well-ordered buffet, commodious lounges and conveniently-placed tables with sparkling carafes, and other appointments are indica-

tions that the Company is determined to be second to none in catering for the wants of its customers.

We will take a cup of coffee—or whatever else you may desire—and pass on to the "dormitorios." And in doing this we encounter no difficulty, however fast the train is running, owing to the fact that the spaces between the various coaches are practically bridged over by the solid platforms, with protective railing provided at the ends of the respective carriages.

The contrast between the interior of the "sleepers" and of the car we have just left is remarkable. In the latter all was animation and excitement; here we find a subdued, restful light; conversation carried on, if at all, in undertones; and occasionally we hear a gentle murmur from the lips of one who at this moment is perchance "the world forgetting, by the world forgot." In the main saloon of each coach the beds are arranged in double tiers, giving a total accommodation for twelve

passengers, while further on there are four-bedded and two-bedded compartments. It is superfluous to remark that the lavatory and general arrangements are perfect.

Beyond these domains of Morpheus there are the brake-vans, into the recesses of which we need not penetrate, and so we will return to the buffet-car for the sake of a quiet chat before we part for the night.

The train is now well on the way. We have passed the fashionable suburb of Belgrano and the little town of San Martin (the terminal station for most of the local trains), where some "equipage" wagons have been taken on, and a powerful tender-engine, better adapted for hauling a heavy load, has been substituted for the tank-engine which brought us from Retiro, and we are now running through the "camp," as the rural district is here termed.

In due time we reach Campana, the headquarters of the locomotive, carriage, and wagon works of this railway, and it may not be amiss to say something about the industry carried on at this important centre, notwithstanding the fact that in the course of our present journey we have arrived during the night.

The shops, which are under the management of Mr. H. Pearse, the locomotive superintendent, occupy a large area, and comprise those found on all railways of importance, separate buildings being, of course, occupied by the carriage and wagon erectors, fitters, turners, smiths, carpenters, painters, etc. A foundry is in active operation, and the men in the automatic vacuum brake shop are kept constantly employed, all the coaching stock and a great many of the wagons being provided with this appliance.

The Company's rolling stock at present consists of 109 engines of all classes—express, heavy goods, and side-tank (for local running). Most of these have been supplied by Messrs. Beyer, Peacock and Co., of Manchester, being sent out from England in parts and erected on this side. The latest received are the express engines, by means of which a service, rapid for this country, is given between Buenos Aires and Tucuman, the distance of 1,155 kilometres (717 $\frac{3}{4}$ miles) being covered in 27

hours, or at the average rate of 43 kilometres (26 $\frac{1}{2}$ miles) per hour.

These engines are "simple" (this type having been found to work most successfully under the conditions imposed by the exigency of the service), with four wheels, coupled, 6ft. 1 $\frac{1}{2}$ in. diameter; leading four-wheel bogie, of which the wheels are 3ft. 2in. diameter; cylinders, 18in. diameter by 24in. stroke; wheel base, 21ft. 7in.; weight, 46 tons 12 cwt.; total weight of engine and tender, 72 tons 14 cwt. A "miriñaque," or cow-catcher, is, in accordance with the invariable custom in this country, fixed just below the buffer-beam. All the engines are, I may mention, driven from the right-hand side of the footplate.

The coaching stock comprises first-class



INTERIOR OF DINING SALOON, BUENOS AIRES
AND ROSARIO RAILWAY

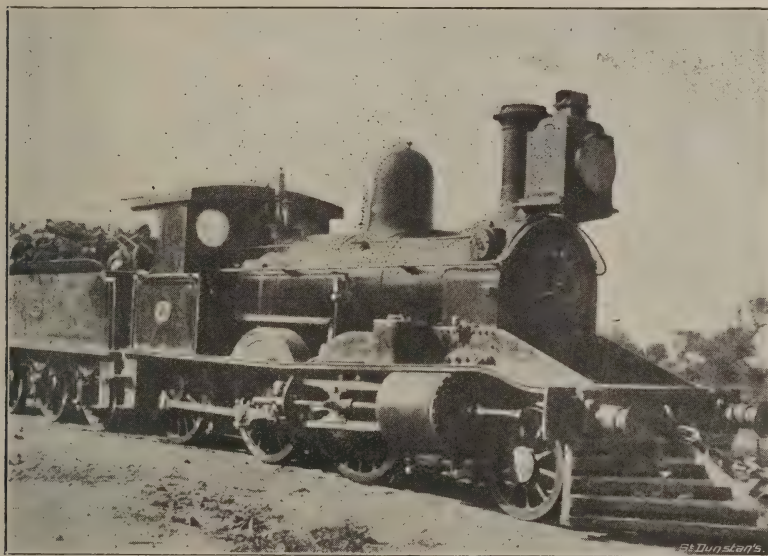
The passenger on the right is in the act of clapping his hands, the ordinary method of attracting the attention of waiters, etc., although all the tables are provided with electric bells

ordinary, family saloons (with compartments), sleeping, dining, and buffet coaches, composite and second-class cars, etc., in all 240 vehicles, thoroughly well constructed, and maintained in excellent condition. The system of lighting throughout is "Pintsch's Patent Gas," which has proved admirably adapted for the purpose.

As in the case of the locomotives, many of the coaches have been imported in sections and put together here; but some very successful work has also been entirely carried out in the Campana shops, several vestibule trains having been lately turned out there in a most creditable manner, and a number of the earlier

Here we find abundant evidence of the importance of the traffic dealt with by this railway. Enormous grain sheds and an elevator situate on the precipitous banks of the Paraná, "chutes" for loading vessels berthed at the foot of the "barranca," a network of rails leading from the main line to numerous

private establishments as well as to the Company's warehouses, the arrangements made for the rapid discharge of wagons, besides a host of contrivances of various kinds, the necessity for which has been dictated by experience, all point to the tremendous demand which is made upon the Company's resources during a busy grain season, and demonstrate the fact that no effort has been spared in the way of making provision to cope with the exigencies of the time.



HEAVY GOODS ENGINE, CONSTRUCTED BY BEYER, PEACOCK AND CO.
FOR THE BUENOS AIRES AND ROSARIO RAILWAY

This is of the "compound" type; diameter of cylinders 18 and 26 in., stroke 24 in.
Wheel base of engine, 21 ft. 10 in. Weight of engine, 43 tons 18 cwt. 2 qr.;
of tender, 23 tons 10 cwt.; total weight, 72 tons 8 cwt. 2 qr.

stock converted, to be more in harmony with modern requirements.

There are upwards of 4,500 wagons of all descriptions—covered goods, low-sided, sugar-cane and firewood, and cattle and sheep trucks. A great many of these, principally cane and sheep wagons, have been "converted" locally.

Resuming our places in the train, which is again quickly in motion, we pass (asleep, for the greater part of the time, in a comfortable bed) through a long stretch of comparatively level country, devoted for the most part to cattle raising and maize and potato growing, and after making short stoppages at two or three important stations and a number of roadside ones we arrive at the city of Rosario, aptly termed "the Liverpool of the Plate."

The passenger station is commodious and well up to date, the offices, restaurant, and platforms being of ample dimensions, roofed over, and, as well as the goods yard, running sheds, etc., lit by electricity.

We arrive at the scheduled time of 6.45 a.m., and, having waited half an hour for the purpose of changing engines and doing some necessary shunting, we proceed on our way to the north. Punctuality, it may be said, is steadfastly observed on this line, and even the long-distance trains run strictly "on time." In this respect, indeed, it is not too much to hint that some of the English railways might not scorn to take a lesson from the excellent working generally observed on the foremost lines in Argentina.

Leaving the suburbs of Rosario behind, we

soon find ourselves traversing the principal grain district of the Republic, and in a good year, just before harvest, it is marvellous to note the teeming crops which are produced from the fertile land. Nature seems to be untired in scattering her prolific bounties with a lavish hand, and, on his part, man has to bestir himself to gather in and store the goods thus freely given. At every station large sheds have been constructed for the housing of the wheat, and in a fruitful season it is not unusual to see these full to repletion and flowing over. It is, of course, needless to remark that we have what are called "bad times" here as elsewhere, but taking one crop with another the average is undeniably satisfactory. The farmers' greatest enemy is perhaps the locust, but the worst visitations of this plague are happily "few and far between," and the energetic efforts which are being made by the Government and the numerous sub-committees throughout the provinces to stamp out the nuisance will doubtless have a good result.

On approaching Irigoyen, the junction with the Santa Fé branch, it being nearly 10 a.m., we seek breakfast in a dining saloon which was attached to the train at Rosario, and, thanks to the excellent accommodation thus supplied, we are enabled to take a comfortable meal while we are rushing along the iron road, instead of snatching a few hurried mouthfuls in a station "caterina."

At Galvez passengers for the branch to Morteros, in the province of Cordoba, have to change coaches. This "ramal," 117 miles in length, intersects the cornfields in that district, and serves as a most useful feeder to the main line, and the same may be said of the Santa Fé branch above mentioned.

Sunchales, Ceres, Pinto, with numerous intermediate stations, follow, and everywhere we observe the foresight which has given to these places the opportunity of developing and promptly dealing with the traffic, which as we go further we find to be changing its nature from grain to cattle, timber, and firewood.

We reach Pinto at 7.25 p.m., and having while still running enjoyed a well-served dinner in the "coche-comedor," we shortly afterwards, for the second time on our journey, betake ourselves to bed.

The next morning at 5.50 we stop at Cevil Pozo, the junction station for the Chañar, Lastenia, and Concepcion branches. We are now in the heart of the sugar country, cane-fields flourish on either side of the line, and the tall chimneys of the factories are visible in all directions.

This district is, next to the cereal zone, the most important traversed by the line, and great expenditure has been necessary in order to comply with the requirements of the "Ingenio" owners, most of whose establishments are also served by a rival railway—the keenest competition being naturally the result. That the traffic is worth gaining, and has been secured, is shown by the fact that the quantity of sugar transported over the Rosario line has risen from 28,000 tons in 1891 (when the extension to Tucuman was opened) to 58,000



EXTERIOR OF TUCUMAN TERMINUS, BUENOS AIRES AND ROSARIO RAILWAY

tons of sugar, in addition to more than 75,000 tons of cane in 1897. There is also a very large movement in firewood for the use of the factories.

Half an hour afterwards we enter the magnificent station of Tucuman, a spacious edifice comprising all the elaborate needs of a first-class terminus. As at Rosario, kerosene has

been supplanted by electricity for the purpose of lighting the building and the adjacent goods depôt, where the large and well-filled cargo sheds testify to the magnitude of the work done at this centre.

Having now—though in a necessarily perfunctory manner—conducted the reader over the railway from end to end, I will endeavour to give some information with respect to subjects not previously commented upon.

recently relaid with rails of the same class, and the remainder of the road, speaking generally, is laid with the third kind of material. The points and crossings at the principal stations are also constructed of the heavier metal, and ballasted with stone.

The line is fenced on both sides throughout its length, and is maintained in a high state of efficiency. On the inner or suburban section the stations are provided with interlocking



BRIDGE CARRYING THE BUENOS AIRES AND ROSARIO RAILWAY ACROSS THE RIVER SALADO

The permanent way consists of three types of road, namely, (a) 75lb. steel rails laid on hardwood sleepers and ballasted with stone, (b) the same description of rails used with ordinary earth ballast, and (c) a lighter section of rail employed where the traffic is comparatively small. The steel rails and stone ballast are naturally required on the line from Palermo Chico to San Martin (between which points there is a double track), owing to the heavy suburban traffic which has to be provided for. From the last-named station to Campana the line, which is single, has been

signalling of the most approved pattern, and here, as well as at other busy points, "block" working is rigidly enforced. The telegraph system, which extends over the whole of the line, is excellent.

The gradients are not severe; roughly calculating, about one-third of the road is horizontal. Of the remainder, the chief gradients would in Argentina be described as one of 7.2 per mil for a distance of 850 metres, and another of 6.5 per mil for nearly 7 kilometres, on the main line; and two of 10 and 8.2 per mil respectively on the Chafar branch, the

former continuing for about $2\frac{1}{2}$ kilometres, and the latter for 1 kilometre.

No tunnel exists, but there is a viaduct 358 metres long, and the bridges number 138, their total length working out to an average of 6.20 metres per kilometre of line. Those



NEW LATTICE GIRDER VIADUCT OF THE BUENOS AIRES AND ROSARIO RAILWAY AT RETIRO

of the greatest dimensions are each about a mile and a quarter long, the one crossing the river Dulce on the branch to Santiago del Estero, and the other the river Salado near the city of Santa Fé.

Mention should here be made of the great work which is now being carried out to the designs and under the superintendence of the resident engineer. It is intended for the purpose of affording the railway an independent entrance of its own to its cargo deposits at Retiro, and consists of an embankment some 750 metres in length, followed by a viaduct of wrought-iron lattice girders supported on cast-iron columns, extending for a distance of over two kilometres, and succeeded by three kilometres of river wall on which the rails are laid. In this new line there are three principal road bridges—one of three spans of 14.56 metres, 15.23 metres, and 29.31 metres respectively; another with one span of 39.25 metres, and a second of 23.14 metres; and the third with a single span of 40.54 metres.

The whole construction, which is the most important of its kind hitherto attempted in this country, is manifestly of a very costly nature, but when completed it will doubtless prove of immense advantage to the railway, owing to the facilities which will be gained for dealing with goods and passenger traffic, the more so as a further extension is being executed in order to unite the Rosario Company's system with the Buenos Aires port lines belonging to the National Government.

The Company owns a wharf at Campana, where steamers from Europe can discharge their cargo without difficulty, and another at San Nicolas.

At Tigre (the holiday resort of dwellers in the city), in addition to a commodious landing stage on the river bank, there is a large dock

with every convenience for the reception of boats engaged in the fruit traffic, which in the season is very heavy. The wants of passengers also, at this station, have been amply anticipated by the erection of a handsome



A ROADSIDE STATION OF THE TIGRE BRANCH OF THE BUENOS AIRES AND ROSARIO RAILWAY

building destined solely for the purposes of a restaurant.

Some idea of the material advancement of the railway during the five years ending with

1896 may be gained from the following comparative table of the principal items of traffic:—

	1891. Tons.	1896. Tons.
Grain and flour	224,662 ...	261,870
Sugar (and cane in 1896) ..	27,959 ...	143,743
Timber and firewood ...	72,319 ...	221,866
Stone	403 ...	5,240
Bricks	5,167 ...	55,457

In 1897, owing to the disastrous result of the grain harvest, the quantity of cereals transported was less, but, as previously mentioned, the movement in sugar and cane exceeded 133,000 tons, although in consequence of late frosts, etc., the crop of cane was somewhat below the average.

During the same quinquennial period the number of train miles annually run rose from 1,460,866 to 1,843,848.

Another interesting fact to be noted in this connection is that in 1886 the total daily number of trains running on the various sections of the line was *twelve*; now the passenger trains alone exceed 140.

The increase in the number of stations (many of them being, of course, rendered necessary by the extensions carried out) is also marked. It is curious to observe the practice which has obtained in their nomenclature. Frequently a roadside station bears the name of the former holder of the property on which it has been built, and report goes that the four daughters of the previous landowner were responsible for the appellations of as many stations—Hersilia, Ceres, Selva, and Argentina. One station on the northern section originally had the remarkable and somewhat mystifying cognomen of “No

Tengo”—literally “I have not”; but the Railway Board subsequently caused its title to be changed to “Lugones,” in commemoration of a deceased warrior.

The line is under the direction of Mr. Jason Rigby, C.E., the General Manager, a gentleman who has had large and varied experience in the conduct of similar enterprises in Brazil, Entre Rios, etc. Mr. C. Wibberley is the Assistant Manager and Traffic Superintendent.

There are three representatives in Argentina



4.30 A.M. AT TIGRE DOCKS
Loading up the Fruit Train from the Boats

of the London directorate, who, with the General Manager, constitute the “Local Committee.”

The London offices of the Company are at 3A, Coleman Street, E.C.; and the Board of Directors consists of Frank Parish, Esq., Chairman; G. W. Drabble, Esq.; R. J. Neild, Esq.; J. W. Todd, Esq.; and J. B. Davison, Esq., Managing Director and Secretary, who ably conducts the business of the railway in relation to home affairs.

In conclusion, I desire to express my appreciation of Mr. Rigby's kindness in permitting me to have copies made of various photographs belonging to the Administration, a work in which I have been greatly assisted by Mr. T. G. Richards, of the Traffic Department.

THE EVOLUTION OF THE PERMANENT-WAY

BY R. PRICE-WILLIAMS, M.INST.C.E.



UNDER the comprehensive title of the "Permanent Way" of a railway is included the rails, chairs (where, as in this country, the latter are chiefly used), sleepers, and fastenings, and the bed of ballast upon which it is laid, the term "permanent" being originally employed to distinguish it from the light and rudely constructed temporary line of way laid down for the purpose of removing the excavations from the cuttings and depositing the material required in the formation of the embankments, and also for the conveyance of other material used in making the railway; the need, however, of such a distinction in the early days of railways, when there was very little in their primitive structural character to distinguish them, has long since ceased. The application, however, of the term "permanent" in the sense evidently intended, and fairly applicable in the case of earthworks, viaducts, bridges, and other permanent structures subjected only to the slow action of time and weather, was singularly inappropriate. The retention of the term, however, serves to show very strikingly how little the engineers of that day realised the fact that the large and rapid development of the traffic which resulted from the increased facilities and large reductions in the cost of haulage afforded by railways would necessarily be accompanied by a corresponding and unlooked-for amount of wear and tear of the rude and perishable material of which the permanent-way was originally composed.

In the "wooden ways," or tramways, as they

were called, laid down between the collieries and the River Tyne about 200 years ago, we have unquestionably the origin of the "permanent-way" of the present day. Roger North, in describing a visit paid by his brother, Lord Guilford, to Newcastle about that time, says of them:—"That the manner of carriage is by laying rails of timber from the colliery down to the river exactly straight and parallel. The bulky carts are made with four rollets fitting these rails, whereby the carriage is so easy that one horse will draw four or five chaldrons of coal, and is of immense benefit to the coal merchants."

These timber tramways, laid upon and fastened to the cross timbers called "sleepers" in the manner shown in the illustration, came into very general use in the coal and iron districts towards the close of the last century, and were instrumental in the development of a large amount of mineral traffic; the wear and tear, however, of this heavy class of traffic soon proved too much for the very limited power of endurance of the frail timber, and various expedients were had recourse to in



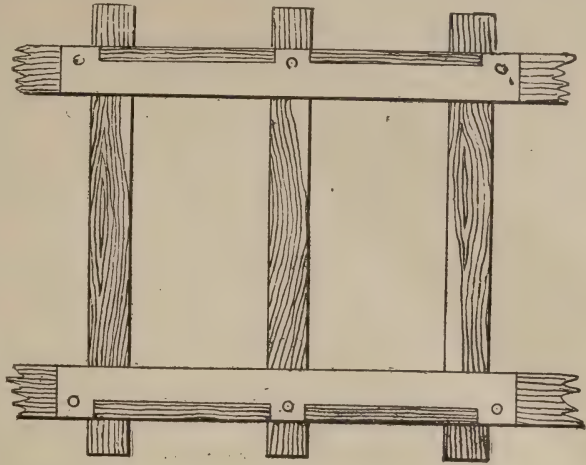
Section of the first wooden Tramway

order to remedy this. At Coalbrook Dale, where the "wooden way" had given out, it happened to be at a time of great depression in the iron trade, and in order to keep the blast furnaces going "the make" of iron pigs had to be stocked. It, however, occurred to the astute manager of that day that a portion of his store of pigs might be made to serve the double purpose of paving a better and

cheaper way to market for it when the demand came, and accordingly he had some of the pigs cast into rough slabs or plates, with holes cast in them so as to fasten them down to the top surface of the timber, and in this way succeeded in giving a new life to the worn-out timber ways. The device answered so well that the cast-iron plates continued to remain in that most useful and profitable form of stock, and resulted in the adoption of the well-known L-shaped cast tram-plates, still to be seen in some of the colliery districts in this country.

The word "tram" is generally considered as an abbreviation of Outram, the name of the reputed inventor of the tramway, the tram wagons being kept on the track by the vertical flange of the tram-plates, as shown in the illustration. Although the adoption of the L-shaped tram-plate resulted in greatly reducing the cost of haulage and largely contributed to the opening out and development of the rich mineral resources of this country during a considerable period preceding the introduction of the

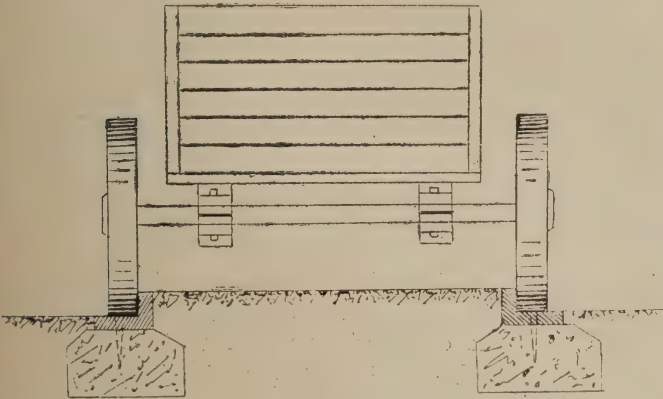
rail, in which we have for the first time a dim foreshadowing of the form of rail which has given its title to the present railway system throughout the world. These edge rails, an



The first cast iron tram rails of the Colebrookdale Iron Company. Scale 2 1/2"

illustration of which is given on page 158, like the tram-plates, were cast in short lengths of from 3ft. to 4ft., their ends being secured in chairs resting and fixed down upon wooden sleepers, and sometimes upon stone blocks.

Another remarkable feature in the edge rail tramways, which still plays a most important part in the working of the modern railway system, was the addition of a flange to the inside of the wheel tyre of the wagons and vehicles, as shown in the sketch, by means of which they were not only kept on the track in a much better and more effective way than by the vertical flange on the tram-plate, but by distributing the weight of the wagon upon the surface of the wheel tyre the wear of the rail or tram-plate was greatly reduced; and what was



Sketch of early Tram Wagon with Cast Iron Tram Plate and Stone Block.

railway system, there were objectionable features in its form affecting the working of the traffic which led to the invention in 1780 of what is known as Jessop's cast-iron edge

even of far greater importance, the increased adhesion between the bearing surfaces of the wheel tyres and rail head afforded the means of rendering available the great trac-

tive force stored up in the locomotive. So little, however, was the value of this adhesion then understood that in the earliest form of locomotive the wheel tyre was cogged and the rail cast with similar indentations, so as to give a rack and pinion motion. The result, however, of some simple experiments carried out by Blackett, of Wylam, and subsequently by George Stephenson, clearly established the fact that the adhesion between the surfaces of the tyre of the driving-wheel of a locomotive and the rail head itself were amply sufficient to give effect to the tractive power of the engine; and, in fact, as experience has proved, the actual measure of the available tractive force of the most powerful locomotives of the present day is absolutely governed by the amount of dead weight which can be brought to bear upon its driving-wheels.

The rapid development of tractive power, which speedily followed from the increased weight imposed on the driving-wheels and the greatly improved structure of the locomotive, however, proved too much for the powers of endurance of the brittle cast-iron edge rails. The constant breakdown of the road thus occasioned fortunately led in 1820 to the discovery by Birkenhead of a method of rolling malleable or wrought-iron rails very similar to Jessop's "fish-bellied" section, but in continuous lengths, which were so favourably regarded by George Stephenson as to be adopted by him for both the Stockton and Darlington and Liverpool and Manchester Railways.

It is worthy of note that even at the date of the passing of the Act of the first named railway in 1821 a wooden tramway line was originally contemplated, and that cast-iron rails, patented by Stephenson and Losh in 1816, were subsequently intended to have been substituted; but so rapid had been

the increase in the weight, power, and speed of the locomotive in that short period that, although Stephenson was directly interested in the adoption of his patent rails, he frankly informed his directors, as Dr. Smiles tells us in his charming "Lives of the Engineers," that although his doing so would put £500 in his pocket, he could not do so after the experience he had had, as they would not stand the weight; and, he added, "you will be at no end of expense for repairs and renewals." And, as already stated, light fish-bellied rails, weighing only 28lb. to the yard, were ultimately adopted, the weight of those used on the Liverpool and Manchester Railway having been increased to 33lb.

With the wrought-iron rail, which ushered in the present railway system, the period of the cast-iron tram-plate and edge rail may be considered to have come to an end. It should not, however, be forgotten that, in spite of the brittle character of the material, they fairly met the requirements of the slow and heavy mineral traffic their use was then restricted to, and they well served the purpose of developing



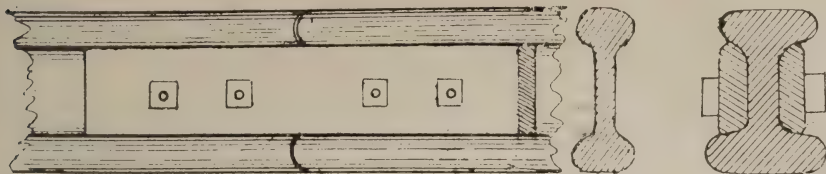
Jessop's Cast Iron Edge Rails and Flanged Wheel Tyres.

the rich mineral resources which have been, and must continue to be, the main source of the commercial prosperity of this country; and, what has been of almost equal importance, they served as the nursery and training ground for the first tractive efforts of the locomotive, and to develop in a most marvellous way both its tractive power and speed.

The rapid growth of railway traffic in this country since the first introduction of the

wrought-iron rail has been phenomenal, and it is scarcely necessary to say that this could never have been attained without a corresponding increase both in the weight and tractive power of the locomotive and in the

with the ordinary puddled bars, the whole pile constituting a mass of puddled bars or slabs, which, after being heated to a welding heat, were welded together by being repeatedly



Modern "suspended joint" permanent way, showing the use of "fish plates"

strength and endurance of the permanent-way when subjected to the destructive effects of the increased weight and speed of the engine and trains.

It was, however, the much greater elastic strength of the wrought-iron rail and its freedom from brittleness, rather than its greater powers of resistance to the wear and tear of the traffic, which in the first instance led to its being substituted for the cast-iron tramplate and edge rail. So rapid indeed was the growth of the traffic, and so great the wear and tear it occasioned, that about the year 1860 the best description of iron rails, greatly strengthened as they had been in weight and section, became worn out in the short space of two years on some of the most heavily worked portions of our main lines, and the risks attending the frequent renewals of the rails had become so great as to be a positive source of danger. Various expedients were had recourse to with the view of increasing their strength and durability, the most effective being by improving the quality of the slabs of iron or steel forming the top and bottom of the double-headed rail. This form of rail was made out of what is termed a "pile," the top and bottom slabs of which, as shown in the accompanying sketch, were made out of a separate pile of the best description of puddled bar-iron, made from refined metal and having a highly crystalline fracture, the interior of the pile being formed

rolled out into the finished rail.

The main defects in the wrought-iron rail were due in the first place to the insufficient

hardness, combined with toughness, of the material forming the top and bottom tables of the rails, subjected to the wear and tear of the trains; and, in the second place, to the difficulty of welding the materials together in a solid mass, the hammering action of the train frequently causing the top slab to separate from the interior mass, and either to break off suddenly or to be quickly hammered to pieces.

It fortunately happened that just at this particular period, when the over-tasked condition of the wrought-iron permanent-way had begun to be well recognised, a most remarkable discovery was made of an entirely new process—the now well-known Bessemer process—by means of which a material possessing in a high degree all the much-needed qualities of homogeneity, strength, and durability was made by so simple and inexpensive a method, and in such large quantities, as to have now entirely put an end to iron rail manufacture.

Allusion has been made to Birkenshaw's opportune discovery of the process of rolling wrought-iron rails just before the opening of the Stockton and Darlington and Liverpool and Manchester Railways, when the brittle cast-iron edge rails of Jessop proved to be incapable of bearing the comparatively light weight of Stephenson's first locomotives. The same may be said, and with even more fitness, as regards the singular opportuneness of the invention of the Bessemer process; and what

makes it still more remarkable is that at the time of the discovery the great inventor of the process was not at all aware of the need that existed for the material for such a purpose, the great object he had then in view, as he has often told the writer, being to obtain a better material than cast-iron for the breech-loading cannon he had invented, made of cast-iron, which exploded at the first shot when tried in the presence of the late Emperor Napoleon III. at Vincennes; and it is still more remarkable that it is to this explosion of his unfortunate breech-loading cannon (which at the time he regarded as a great calamity), and to a chance remark which Minnie, of rifle fame, made to him on the occasion—viz., "We

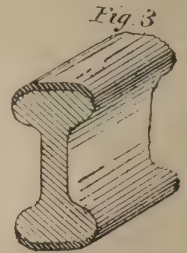
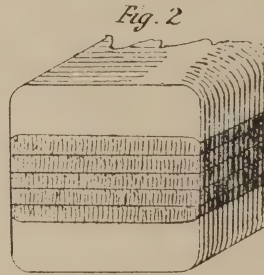
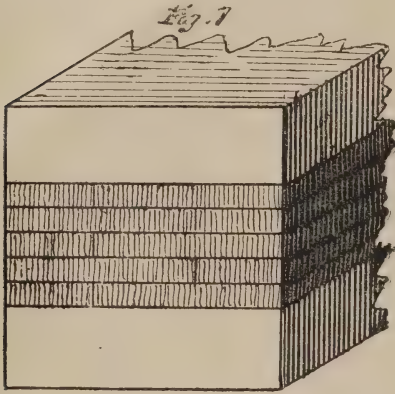


Fig. 1 and 2 show the method of forming wrought-iron "double-headed" rails and Fig. 3 is a section of a "double-headed" rail.

want a better material than cast-iron for guns, Mr. Bessemer"—that we owe this discovery of the Bessemer process. This remark of Minnie's, he told the writer, kept constantly ringing in his ears, and on his return to England it induced him to ascertain what the chemical constituents of cast-iron were; and the information he obtained on the subject from Percy's "Metallurgy," then but recently published, led to those further investigations and experiments at St. Pancras which resulted in the discovery of a simple and beautiful process, which it is not too much to say has completely revolutionised the iron and steel industry of the world, not only by enabling a very high class of steel material

to be produced in enormous quantities, but at such a low price as to have entirely extinguished iron rail manufacture.

The large annual saving in the maintenance and renewal both of the permanent-way and locomotive stock (two of the largest items of the working expenditure of a railway) which has resulted during the last thirty years from the use of this splendid and much more durable material is almost incalculable. The actual figures, however, as obtained from the published reports of the London and North Western Railway, may serve as a good illustration, as it is not only the principal railway company in the kingdom, but was the first to make use of the new material. The mileage open, which in 1874 a little exceeded 1,500 miles, has during the succeeding twenty-four years increased to nearly 2,000

(1,908) miles, while the tonnage conveyed over it has almost doubled, and the train mileage increased 50 per cent. Notwithstanding these large increases in the traffic, train mileage, and additions to the mileage of railway worked, the total annual cost of the maintenance of the permanent-way has absolutely decreased from £698,000 to £606,000, and the cost per mile from £446 to £317, the total saving, as more correctly determined in terms of the reduced cost per mile, having in that period amounted to over £5,700,000.

The average annual cost of the maintenance and renewals of the locomotive stock (of a much heavier and more powerful type) has during the same period been reduced from

£197 to £157 per engine, and the saving resulting therefrom to nearly seven millions sterling (£6,987,000), so that altogether in the case of this one single and fairly typical railway company, whose mileage is only just one-eleventh of that of the railways in the United Kingdom, the total saving in the working expenditure has been nearly thirteen millions sterling. Assuming, however (after making full allowance for the mileage of light traffic lines where iron rails still continue in use, and for the Siemens-Martin steel now extensively used in the manufacture of locomotives), that only half this saving has been effected on other railways, it will be seen that even then the total saving in the working expenses of the railway companies in this country alone attributable to the use of this splendid material would amount to over seventy-one millions sterling!

The 22,000 miles of railway in this country, however, is as nothing compared with the 192,000 miles in the United States, by far the greater proportion of which has been constructed since the invention of the Bessemer process. The increase in the mileage there, in the British Colonies, and elsewhere has been something enormous, and it is estimated that out of the 360,000 miles of railway now in operation throughout the world more than two-thirds are laid with Bessemer steel. What the direct saving has been in the working expenses attributable to this huge mileage of railway, apart from the great benefits resulting from their development of the great natural resources of vast and hitherto inaccessible regions, it is impossible to form any adequate idea.

Of the remaining portions of the permanent-way—viz., the “points and crossings,” the fish-plates and bolts—there is little to be said as regards their strength and durability, except that they at present admittedly constitute the weakest and least satisfactory part of it, and that beyond being made of steel instead of iron the former are of the same antiquated type in use at the time of the opening of the Stockton and Darlington

Railway, with the objectionable features of thin and flexible knife edges at the facing points, and the equally objectionable break in the continuity of the main line rails at the crossings, which continue to be the cause of some of the most frequent and dangerous class of railway accidents. The fish-plates and bolts are of much more recent origin, and greatly contribute to the increased safety and easier motion of the trains by preventing any movement or displacement of the rail ends (a frequent cause of accidents in the early days of railways), but they have not added to the strength of the rail at the joint ends, as recent tests carried out by the writer prove they have little more than half the strength of the solid or unbroken rail.

The origin of the invention of the fish-plates is so singular and so little known as to well deserve mention. The circumstances were communicated to the writer by the late Mr. Harrison, the uncle of Lord Brassey. It happened that about the time of the invention some of the timber bridges on the Eastern Counties required renewing, and it occurred to the chief engineer that an effectual way of accomplishing this would be to weld together the ends of the wrought-iron rails throughout the length of the bridge and for some distance on either side of it, so as to form a sort of suspension chain. This was accordingly done. The welded ends of the rails, however, made such rough running over them as to add rather than to diminish the unstability of the bridge. The order, therefore, was given to have them at once removed. A carpenter, engaged in repairing the bridge, said to the chief engineer, “Would your honour take a hint from an old ship’s carpenter and splice and bolt the rails as we do masts on board ship?” and, suiting the action to the word, took out his two-foot rule and placed it between the cheeks of the rails, giving the first crude idea of fish-plates now in general use. The ship’s carpenter’s hint was at once adopted, and resulted in a most valuable patent being taken out, from which, however, the poor ship’s carpenter never derived any benefit!

THE WEST CORNWALL RAILWAY

BY V. L. WHITECHURCH



AS stated in the December, 1898, issue of the RAILWAY MAGAZINE, English people in search of comfortable winter quarters are beginning to recognise that the trouble, fatigue, and, above all, the expense of a journey to the South of France is no longer necessary. They can obtain all they desire in West Cornwall, which boldly rivals the South of France in the mildness of its range of climates, and surpasses them in geniality and equability. There is little difference between the day and night

tion of our country traversed by a steam locomotive, and therefore occupies a leading position in the history of our railways. The centre of interest is the town of Redruth, celebrated for its surrounding copper mines, many of which now, alas! are in silence and unworked. It was here that William Murdock, in 1784, made a little three-wheeled steam carriage, and tried its running powers one night on returning from his work in the Redruth mine. The scene of his experiment was in the locality of the church on a lonely road. The machine seems to have run away from him, and to have dashed into the worthy vicar



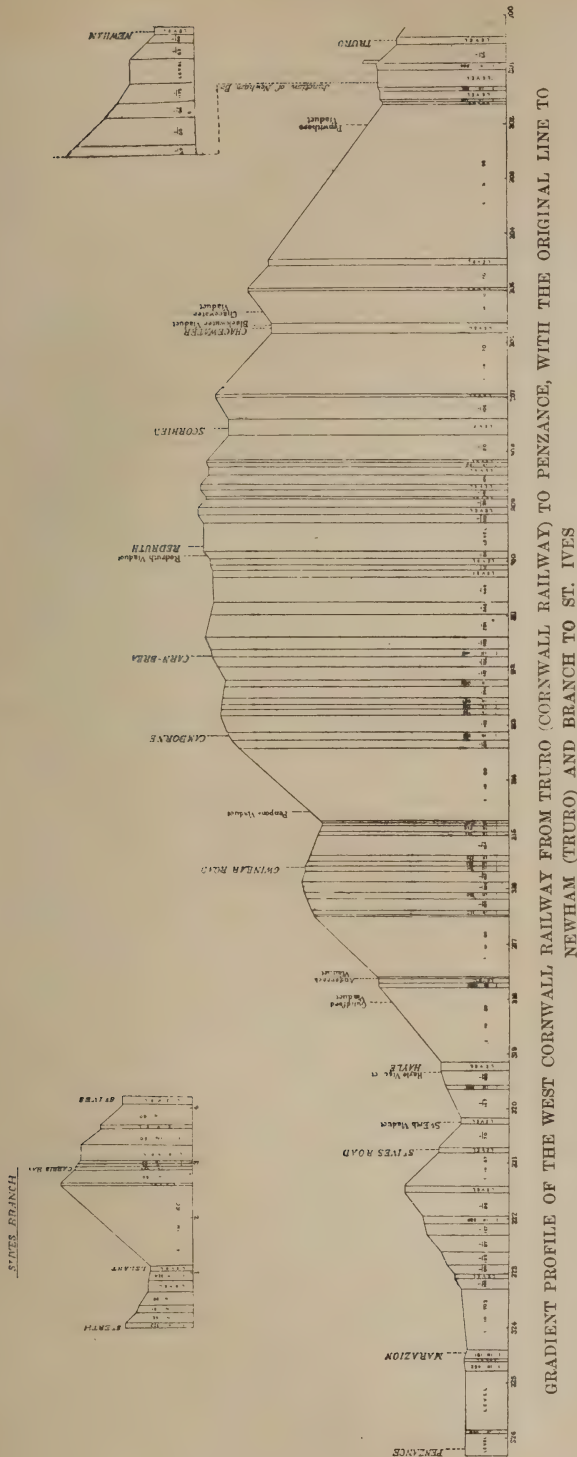
VIEW OF TRURO, SHOWING THE WOODEN VIADUCT CARRYING THE G.W.R. ACROSS THE CITY

temperatures, and the prevalence of south and west winds brings a large amount of ozone. Snow and frost are rarely recorded in the winter. This season is now in full swing, and will extend beyond Easter. Intending visitors to Cornwall and other readers will therefore be glad to learn some details of local railway history.

The western part of Cornwall between Truro and Land's End furnishes the railway enthusiast with a host of reminiscences and interesting data. Remote as this district is it may nevertheless proudly claim to be the first por-

tion of the parish, who mistook it for his Satanic majesty in person, and gave vent to shouts of despair.

Then we have the celebrated Richard Trevithick, a pupil of Murdock and captain of a neighbouring tin mine, and who lived for some time at Hayle. In 1802 he took out a patent for a steam carriage to be used on ordinary roads, and which took the form of a coach on four wheels. It is thus described in Smiles' "Life of George Stephenson": "The engine had one horizontal cylinder, which, together with the boiler and



the furnace-box, was placed in the rear of the hind axle. The motion of the piston was transmitted to a separate crank-axle, from which, through the medium of spur-gear, the axle of the driving-wheel (which was mounted with a fly-wheel) derived its motion. The steam-cocks and the force-pump, as also the bellows used for the purpose of quickening combustion in the furnace, were worked off the same crank-axle. This was the first successful high-pressure engine constructed on the principle of moving a piston by the elasticity of steam against the pressure only of the atmosphere."

This steam carriage was exhibited in London. It was driven to Plymouth by road, and there is a good story told of a certain turnpike-keeper who opened his gate in fear and trembling to the snorting novelty, and when asked what there was to pay, replied, "No—noth—nothing to pay! My dear Mr. Devil, do drive on as fast as you can! Nothing to pay!" The name of Trevithick was afterwards perpetuated by his son's famous "Cornwall" locomotive, built at Crewe in 1847 for the London and North Western Railway, with a driving-wheel 8ft. 6in. in diameter.

As mentioned in the article on the Cornwall Minerals Railway, the first railway ever opened in this district was the Redruth and Devoran, dating back to 1825, first worked by horse-power, and still existing for mineral traffic. But the earliest line of real importance—the foundation of the "West Cornwall" system—was a railway joining the mining centre of Redruth with the seaport town of Hayle. The reason for this is obvious. It provided an outlet for tin and copper, much of which was taken up to Bristol by ships, and an inlet for cargoes of coal from South Wales. This piece of line was opened for mineral traffic in 1839, and for passenger traffic in 1841.

The railway from Redruth to Hayle was celebrated for several features of interest. The metals were laid on

stone sleepers, some of which still remain on the old part of the line not now used, and very rickety and noisy was a journey over them. The terminus at Hayle was below the present station, and the river was crossed by a swing bridge, the trains being worked over by horse-power. Just out of Hayle was a steep gradient known as the "Angarrack incline," on the top of which was a stationary engine which hauled up and let down the trains with a rope, the locomotive being *on* the train and assisting. On one occasion, when a train filled with excursionists was on this incline, the rope broke; but, marvellous to relate, although the passengers experienced a somewhat faster journey than they had anticipated, not one of them was hurt.

About one mile west of the present Camborne Station was another incline on the old Hayle and Redruth line, known as the "Penponds incline." This was half a mile in length, and was worked by means of "balancing trucks" on a double line. On the top were two drums, heading each line, round which stretched the hauling rope. A number of laden trucks running down on one line pulled the train, with the assistance of the locomotive, up the other line. Of course such things would not be tolerated by the Board of Trade now for passenger traffic, but in those days the Cornish folk did not do much railway travelling. To run for a few miles on the Portreath branch to "Lovely Cottage," or to come down the Angarrack incline into Hayle, packed in open thirds—aye, and coal trucks too—was the event of a year, and they had not yet realised that railway travelling meant more than a local excursion.

In 1851 the Hayle and Redruth line was extended to Penzance under the name of the "West Cornwall Railway." When, however, I

speak of an "extension" it would be more proper to say that only a *part* of the old line was used, the new line being diverted in order to do away with the Angarrack and Penponds inclines. As one travels down to Penzance to-day one catches a glimpse of the embankment of the old track leaving the present main line on the right, about a mile west of Gwinear



GUARD ESCOTT AND HIS TRAIN
(Escott is one of the original "West Cornwall" men)

Road Station. The line is now carried over the valley by the "Angarrack Viaduct," which has passed through three stages, being first made of wood, then wood with stone pillars, and lastly entirely of stone.

Among the early directors of the West Cornwall line the names of Richard Pearce, R. V. Davy, H. O. Wills (of tobacco fame), Louis Vigurs, Edwin Lee, and William Bolitho must be noted, together with Mr. Fitzgerald Church, the first secretary, and Mr. Henry Roach, the last.

The next extension of the "West Cornwall Railway" was towards the east, from Redruth to a point about a mile westward of Truro, known as Penwithers. Only a signal-cabin now stands on this spot, which, by the way, was also known as Higher Town. This branch was opened on March 11th, 1852, and was subsequently extended to Newham, about one

mile further on and to the south of Truro. For some time Newham was the eastern terminus of the West Cornwall line. The branch from Penwithers to Newham still exists, but is only worked for mineral traffic.



WESTWARD HO!

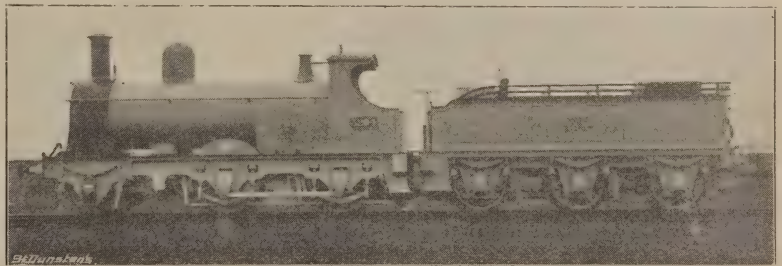
A heavy train, for Cornwall, drawn by two G.W.R. 6-coupled engines

The reader will now perceive that the whole extent of the line at this date was from Newham to Penzance, and perhaps a few notes concerning it may be interesting. For these I am chiefly indebted to Mr. John G. Bone and two old guards who are still in the service of the Great Western Railway—Guard Hocking, who works the “Cornishman,” and Guard Escott, who journeys between St. Erth and St. Ives. I should certainly advise the lover of railways to get into conversation with the two latter if he is ever in the district, for they are full of interesting reminiscences.

The line was originally laid with Barlow rails, and not infrequently the coaches would leave them. On one occasion a first-class carriage travelled a considerable distance off the rails. When it was discovered and the train stopped some of the passengers put their heads out of the window and asked

what was the matter. When they were told that their carriage was off the line they refused to believe it. They hadn't felt any difference! The line, be it noted, was a narrow gauge one, and had its own rolling stock. Originally a few engines were built at Carn Brea, among them being the “Redruth,” “Penzance,” and “Carn Brea”; others were afterwards built for the Company by Stephenson and Co. There was one old engine—the “Ironsides”—which was purchased second-hand, and which must have looked somewhat peculiar, its driver being stationed at one end and the fireman the other. Those were the days of “outside brakes,” and the guards used to sit up in little “sentry-boxes” attached to the trucks. The passenger rolling stock consisted in all of twenty-seven coaches, which were built at Carn Brea and run on four wheels; but there were other “facilities” for passengers. A famous story

is told of a gigantic excursion train that ran forty-one years ago from Redruth to Penzance, conveying a large number of teetotalers for a day's outing. This train consisted of seventy-six vehicles, of which only seventeen were passenger coaches, the rest being trucks with boards nailed across, and was drawn by no less than three engines, two



No. 3204, ONE OF A STURDY CLASS OF G.W.R. LOCOMOTIVES, SUITABLE FOR THE WEST CORNWALL PORTION OF THE SYSTEM

Coupled Wheels, 5ft. diameter; Cylinders, 17in. diameter by 25in. stroke

being in front and one in the middle of the train. And hard work they had to get up the St. Erth bank, where the gradient is one in sixty-seven. Sad to relate, this mammoth party of excursionists left a terrible blot on

their day's outing. On the return journey, whether by design or accident, the driver drew up opposite a large apple orchard. It may have been their anxiety to take extreme measures against such an intoxicating beverage as cider, but at all events that army of teetotalers swarmed down from the trucks and up the apple trees, until the orchard speedily resembled the famous cupboard of Mother Hubbard.



"TO THE WEST! TO THE WEST!"

The Corridor Express journeying to Penzance

The working of the trains, of course, was very different to the present day. The "time" system was in vogue, fifteen minutes' "start" being given to one train before another was allowed to follow it. There was only one signal—a distant one—at each station, no starting signal being used except that of "word of mouth." In the beginning semaphore signals were used, to be replaced by the disc and cross-bar, and these in turn gave way to the semaphore once more. Singularly free from accidents are these old recollections; in fact, I only heard of one very serious one while I was picking up notes, and that was due not to the working of the line but to old Father Neptune, who took it into his head one stormy day to sweep away part of the embankment between Marazion and Penzance. The consequences were peculiar. Some engines at Penzance were taken round by road

in steam, moving, of course, very slowly, and guided by horses.

But a change was before the old West Cornwall Railway, and events were gradually shaping their course for the running of the present 10.35 a.m. corridor from Paddington through to Penzance. Across the valleys of Eastern Cornwall the indefatigable Brunel was building his great wooden viaducts, pushing onward his broad gauge road in utter contradiction to the policy of Stephenson, who always believed in planning the road that paid. Mile by mile that grand "Cornwall Railway" progressed until the Saltash or Albert Bridge planted it in triumph over the flowing tide—a magnificent monument of the master, who never lived to see it working; and on May 4th, 1859, the passenger service between Plymouth and Truro was declared open.

Meanwhile, a short section of line had been laid from Penwithers to the present Truro Station, then the western terminus of the "Cornwall Railway." Here took place for a short time—I believe for one season only—the transference between the two gauges, the "West Cornwall Railway" being, as stated, a narrow gauge line. But the "West Cornwall" had managed to get into low water so far as financial matters were concerned. Dividends were rarities, and at length one of the principal debenture-holders living at Redruth threatened to fix a chain across the line and stop the traffic. The energetic Louis Vigurs, the Chairman of the Company, and Mr. T. S. Bolitho, otherwise known as the "King of Cornwall," on account of his financial influence, took serious action, the result of which was an agreement with the "Associated Companies"—that is, the "Great Western," the "Bristol and Exeter," and the "South Devon." The "Associated Companies" were already

running into Truro, as I showed in a previous article.* The agreement took the form of a lease, and in order to work through traffic an outer rail was now laid down from Truro to Penzance so as to run broad gauge stock. This was completed in 1860, and the first broad gauge engine to run into Penzance was the "Sedley."

Of course it was some time before the capital through communication to the West that now exists was brought to perfection. At first there was only one passenger train a day between Paddington and Penzance, and for a long period the third-class passenger could not travel by the crack trains at all. It may be a revelation to the modern traveller who runs down to Penzance by the "Cornishman" in 8hr. 32min. to learn that, since the introduction of through broad gauge communication, it took the third-class passenger twenty-four hours to travel from Penzance to the Metropolis. The broad gauge was expensive in more ways than one, and, although many of us deplore its abolition, the through narrow gauge route to the Far West that dates from May, 1892, must certainly be considered as a boon to that class of passenger which now predominates—the third class.

In due time the "Bristol and Exeter" and the "South Devon" Railways were bought up entirely by the Great Western, which latter Company then became first sole lessees and then sole proprietors of the "West Cornwall," the final amalgamation dating from 1876. Of course the old shareholders now became possessors of Great Western securities.

Since that date two branches have been opened in connection with this portion of the Great Western system—the line from St. Erth to St. Ives (1877) and that from Gwinear Road to Helston (1887). They were both built by the same contractor, Mr. Thomas Lang, of Liskeard, and financed by Messrs. Bolitho, and afterwards acquired by the Great Western Railway Company. The Helston branch was opened for passenger traffic on May 9th, 1887, and has never been anything but a narrow gauge line. Helston is the nearest station for

the Lizard, and much frequented by tourists. The St. Ives branch was of earlier date, and was opened on June 1st, 1877, being a broad gauge line for some years. This little line, only four miles twenty-two chains in length, is one of the most picturesque and beautifully situated in England. After leaving St. Erth, with a pretty view of Hayle and its harbour on one's right, the train skirts the shore along Carbis Bay and St. Ives Bay, and in one place the passenger looks far down from the cliff-cut track into the sea beneath. The first view of the town of St. Ives, with the forest of masts in its harbour, is caught from the train window as the curve into the station is rounded, and it is a picture of life and beauty that will not easily be forgotten. Acworth says that the two most beautifully-situated railway stations in England are St. Ives and Cromer (Great Eastern). He yields the palm to the latter, but certainly St. Ives comes very near, and in the opinion of some might take first place. It is right on the sea; below it lies a fleet of pilchard boats on the beach, above rises the cliff. The station stands high, and the town itself can be seen curving round the harbour.

I give it as my own opinion that there is no more charming spot on the Cornish coast than St. Ives, because it presents features that one meets with in no other town. On the heights around Tregenna Castle the tourist can enjoy as fresh a breeze and as lovely a land and seascape as he can wish for; but there are other attractions at St. Ives than this more fashionable neighbourhood can give. To wander through the crooked, narrow streets of the lower and older portion of the town, amid the odour of tar and other truly marine whiffs; to gloat over quaint corners, the homes of the toilers of the deep; to stroll down on the harbour quay amid the groups of stalwart, sunburnt mariners in blue jerseys and yellow oilskins; to watch the fleet putting out to sea on a bright morning, the brown sails hoisted up one after the other, the boats slowly leaving in irregular procession with their hardy crews aboard; to wander away beyond the houses to the "island," and climb

* "Railway Magazine," August, 1898, page 138.

to its summit to smoke a pipe with some friendly fisherman, who tells quaint tales of his trade to you that sometimes have a smack of smuggling about them, while you watch the sparkling tide rushing in all around you and the high cliffs standing out in the distance on either side—these are some of the charms of this ancient fishing town. I have met people, and the reader will doubtless sometimes meet them too, who say they do not care for St. Ives, and call it a “dirty little town,” but they are generally the sort

become a popular resort. The most westerly town in England, Penzance stands warm and sheltered around Mount's Bay, and receives the full effect of the Gulf Stream. Out in the bay rises that curious conical rock known as St. Michael's Mount, with the residence of the St. Aubyns on the summit. Penzance abounds in excursions, among which one might mention the Lizard, Land's End, Logan Rock, and Kynance Cove; while a short sea passage carries the adventurous tourist to the Scilly Isles, a locality that I believe is charm-



VIEW OF ST. IVES, SHOWING GREAT WESTERN RAILWAY AND PART OF THE STATION PLATFORM

of folk who do not understand what constitutes real enjoyment in a holiday, and are not to be listened to. At all events I strongly recommend the tourist to go and mingle with the “fishers of St. Ives,” to live a week or two in their town, and he will come away not only freshened in health, but having acquired some bit of knowledge of Cornishmen and their ways. In no place, such is the fisherman's boast, is the Cornish motto “One and All” in such force as among the hardy seafaring folk of this town.

The other seaside town served by the “West Cornwall” merits attention, and has

ing, though I will say nothing about them here, as I have neither visited them myself nor do they boast of a railway.

It is curious in considering the origin of the “West Cornwall Railway” to note that, although it was originally constructed to develop the mineral traffic of the district, at the present time the goods traffic is chiefly drawn from another of the three great “kingdoms”—the vegetable. All around St. Ives, Penzance, Marazion, and St. Erth broccoli and potatoes are grown in large and increasing quantities, and many train-loads are despatched to London and the Midlands.

By growing these two vegetables the land produces two crops annually. From St. Erth, also, large quantities of strawberries are despatched. The influence of the climate in the neighbourhood, combined with railway facilities, has also developed an enormous traffic in flowers. Immense quantities of narcissi are brought over from the Scilly Isles—the “tropics” of England—despatched from Penzance by train, and find a ready market in our large towns before winter has quite let go his icy hold of us; while wall-flowers, stocks, and daffodils are gathered in the Penzance district and sent to Birmingham and other centres—nay, even find their way to Ireland and Scotland. Of course the cultivated ground in the district has increased by leaps and bounds since the opening out of the line, and an increased sphere of employment is the result.

Nor is the “animal kingdom” unrepresented in the traffic of Western Cornwall. The great harvest of the sea is continually being gathered in around the coast, and the number of fishing boats with their crews has increased with the fresh means of disposing of

the harvest in distant neighbourhoods. March to June represents a busy time both for fishermen and railway employes, for then it is that the mackerel season is “on,” and “fish specials” go racing away “Eastward Ho!”

And now I must bring these notes to an end, even as I had, regretfully, to end my little tour to the West during which I was acquiring them. I say regretfully, because I was sorry to turn my back upon some very charming scenery and some very interesting monuments of railway renown; while the kindness and help of the officials with whom I came in contact, most of whom were proud in the boast that they were “Cornishmen”—proud only as the natives of the country of “Tre,” “Pol,” and “Pen.” can be—will “one and all” long and pleasantly linger in my memory.

NOTE.—In the “Times” of May 29th, 1892, it is stated that “the Great Western is under obligation to afford access to Penzance to any narrow gauge railway that shall get to Truro.” What will this mean in the future? The London and South-Western is gradually creeping along the North Cornwall Coast. Will it cross the county? And, if so, will Truro become a second Kinnaber Junction in a race Westward?



AN ACCIDENT AT PRESTON

By JEFF ROBERTSON.



N Accident at Preston." This was surely only too familiar a headline in the newspapers some two years ago, when half a dozen railway accidents, more or less serious, occurred at this unlucky place. During the summer of 1897 the series of mishaps was completed by a *contretemps* of a character so curious that it is surprising that the facts connected with it have so far failed to find their way into print.

In the spring, the season when, as Tennyson reminds us, "a young man's fancy lightly turns to thoughts of love," the Honourable Maurice Templecombe had persuaded his bonnie Scotch lassie, who was none other than Margaret, only daughter of the Earl of Lockerbie, to be his bride. The marriage was fixed for July 10th, and, as may be easily imagined, the interval between the betrothal

and the wedding day proved none too long for the purchase of those many fripperies which the Lady Margaret found necessary for her change of state from *mademoiselle* to *madame*. A visit to London was, of course, indispensable, and many were the hours devoted to Dame Fashion. It is necessary to

describe in some detail the charming travelling dress that she ordered from the well-known firm of Rosie et Cie. The dress was of a soft dove-grey material, fashionably embroidered, and the hat was veritably a *chef d'œuvre*, being a large Gainsborough of the same tone as the gown, trimmed with graceful ostrich feathers fastened by a superb paste buckle; but what gave *ton* to the whole costume was a most perfect imitation in velvet of a large bunch of scarlet geraniums pinned into the waist-belt. To wear artificial

flowers on a day-gown was a novel and somewhat daring idea, albeit one that an acknowledged beauty like Margaret was well able to realise; the brilliant patch of red arrested the eye, which afterwards dwelt with satisfaction on the fair picture of this pretty blonde so

gracefully and becomingly attired.

Now, as luck would have it, Miss Mary Thomas, the artiste whose task it was to design this toilet, had herself promised to make at no very distant date a happy man

of one William Judkins, a shopwalker in the establishment of her employers, Rosie et Cie. This fact naturally intensified the curiosity inherent in woman's nature and will explain why the dressmaker was prompted to inquire, during that mysterious process dimly conveyed to the masculine mind as "trying on,"



"In a reserved first-class compartment in the day express from Euston"

when the marriage was to take place. What was her surprise when Lady Margaret's answer disclosed the fact that the two weddings were to come off on the same day! True it was that the nuptials of the Scotch heiress were to be celebrated at her ancestral

Mrs. William Judkins found themselves in a reserved first-class compartment in the day express from Euston, whilst the Honourable Maurice Templecombe and his wife, *en route* for the Austrian Tyrol, joined the 10 a.m. from Glasgow to London at Lockerbie, at which station the train was specially stopped to pick them up.

* * * *

To all regular travellers by the West Coast route to Scotland Preston Station is familiar. Here it is that for years past until the recent introduction of travelling dining-cars the morning expresses in each direction between Scotland and London have been timed to stop for twenty minutes to admit of hungry passengers partaking of luncheon. The main plat-

form is, in railway parlance, an island—that is to say, it is a central platform with rails on each side of it—and thus serves the purpose of two side platforms of the usual type.

On one side the up Scotch trains load and unload their passengers, and on the opposite side the down expresses call. In the middle of the platform is a large dining-room, and within this, eighteen months ago, when the 10 a.m. from Glasgow to London and the corresponding down train from Euston to Scotland were timed into Preston simultaneously, the passengers from the North and from the metropolis met at the luncheon table.

* * * *

On the eventful day in which the reader is interested it would almost appear that the actions of the Lady Margaret were destined to govern in some occult manner those of the other *nouveau mariée*, for at Preston both ladies, overcome either by shyness or fatigue, elected not to accompany their husbands to the refreshment room. The poor men of course could not forego the pleasure or necessity of appeasing their hunger, and so with



"The remainder of the journey was not altogether unpleasant."

home in Dumfriesshire, and that the *costumière* was to be led to the altar in a corrugated iron edifice in the neighbourhood of New Cross, S.E.; but, nevertheless, the identity of date had a tremendous fascination for the romantic Miss Thomas, and when at length she conceived the idea of treating herself to a gown and hat precisely similar to those to be worn by the earl's daughter her self-satisfaction knew no bounds. Alas for the vanity of human proposals! How dire but too often are their consequences! In this case the sentimental desire of the dressmaker to strengthen in every way the links of association between the fashionable Scotch marriage and her own influenced her to persuade her loving William to choose Rothesay instead of Ramsgate as the scene of their honeymoon. Thus it came about that on July 10th Mr. and

tender looks they tore themselves away. Mr. Judkins wasted little time over his lunch, and returned to the platform several minutes before the warning bell rang. Satisfying himself by a glance at the scarlet geraniums that nobody had run away with his dear wife, he turned his back upon the train and proceeded to light a cigar, fully conscious of the dignity imparted by his frock coat and of the

Whilst the gentlemen were absent it might be imagined that the ladies found the time hang heavily, but such was not the case. Lady Margaret, overcome by the heat, fatigue, and excitement, fell asleep, and Mrs. Judkins, having turned her dutiful attention to one of the many illustrated papers with which her newly-made husband had felt it incumbent on him to provide her, had become enthralled in



"The dumfounded shopwalker was haughtily commanded to withdraw into the lavatory"

conspicuous elegance of his new brown boots, the hue of which proclaimed them altogether innocent of the stain of polish. Thus stood William Judkins, like a lion at the entrance of his lair, until the guard's flag waved and the train began to move; then, tossing away his cigar, he jumped into the carriage. The Honourable Maurice Templecombe took things much more easily, and it was only on hearing the bell that he arose from the table; strolling across the platform he entered the compartment whither, like an oriflamme, the plumes of the Gainsborough beckoned him.

a description of the very trousseau which she herself had helped to complete. Deeply engrossed in the newspaper comments, she scarcely noticed the return of her lord and master, but no sooner had the train started from the platform than the paper was gently brushed aside and a kiss recalled her thoughts to her companion. Covered with sweet confusion, Mary raised her blushing face to behold not her husband, but a handsome stranger, whose tender gaze gives place to a stare of blank bewilderment as he realises that his wife is lost to him and that a meek

looking stranger is arrayed in her apparel. Mary felt very much inclined to faint, but anon recovered a degree of composure sufficient to make mutual explanations possible, and gradually the skein of mystery was unravelled. The remainder of the journey to Carlisle was not altogether unpleasant, at least so thought the fanciful little dress-maker, who rather enjoyed this element of romance on the first day of her honeymoon, and whose merry peals of laughter bore witness more than once to her appreciation of the ludicrous side of the situation.

Far different was the scene that had meanwhile been enacted in the up train. On being awakened from the doze into which she had fallen by her head being held 'twixt two caressing hands, Lady Margaret's horror and indignation knew no bounds at the familiarity of this frock-coated monster. A storm of words followed, but the one-sided conflict was, like the sea-fight off Manila, short, sharp, and decisive, for the ladies of Lockerbie have ever been women of action, and the fair heiress did not belie the reputation of her house. The dumfounded shopwalker was haughtily commanded to withdraw into the lavatory; he obeyed, and, the door being

promptly bolted on him by his cruel jailor, he remained a prisoner until freed from captivity by the arrival of the train at Rugby, its next calling place.

At Rugby and at Carlisle time-tables were feverishly consulted and the telegraph wires largely used, with the result that it soon became apparent that reunion that day could only be brought about by the travellers returning once more to Preston, and this therefore they all prepared to do; but although the four passengers thus abandoned the destinations originally decided on, their luggage got through undisturbed, for in changing trains the ladies forgot all about it.

There is no need to expatiate on the return of the quartette to Preston. Doubtless the reader will guess which two travelled back together and which two did not; his imagination may also be safely trusted to depict the eventual finding of the lost ones on the ill-starred Island, and it only remains to be recorded that the manager of the Railway Hotel at Preston and his spouse sat up till a very late hour indeed speculating as to the peculiar freak of fate which necessitated four "upset-looking individuals" applying to them for the requisite habiliments of night.



LUDGATE HILL STATION

BY CHARLES ROUS-MARTEN



PROBABLY no railway station since iron roads were first invented has ever come in for such an avalanche of gorgeous and whole-souled abuse as has fallen of late upon that of the London, Chatham and Dover at Ludgate Hill. Inferentially, the Company itself and its officers and directors have been the targets for a handsome share of the verbal missiles. It is implied that they might, could, would, should, or ought to have remedied long ago the evils so loudly complained of, and that they were gravely culpable for not doing so.

Now I hold no brief for the Chatham, or any other railway company, and as an earnest advocate of progress in railway matters I have not the slightest disposition to defend any company or board or officer from just charges of neglecting the interests of travellers. But as a practical and impartial professional observer, utterly unprompted by anyone connected with the London, Chatham and Dover Company, and without any consultation with him or them, I do wish, as a matter of mere fairness, to direct attention to a few points which do not seem to have been generally recognised. I may remark that I should have felt less disposition to do so had not the Company's determination to remodel the station been definitely announced. As it is, I may venture to suggest one or two feasible improvements on the scheme which has been foreshadowed.

Of course I have not a syllable to say in praise or defence or extenuation of Ludgate Hill Station. Nor, for that matter, has, I believe, a single soul belonging to the owning Company, from the Chairman and General

Manager to the *juniorest* porter. Its demerits constitute a fixed fact, which cannot be explained away. Here we have an absolute consensus and unanimity of opinion. But Ludgate Hill Station is not the only "scandal" to which London has long submitted in respect of obstruction to traffic, inconvenience to the public, hampering of trade, danger to life and limb. What do you think of Fleet Street, for instance, as one of the main arterial thoroughfares of the greatest and richest city the world has ever seen? How do you view the routes of transit from the North to the South of London, say from Euston to Charing Cross, or St. Pancras to Waterloo? How do you like the tunnels and stairs of the Underground Railway? I need not go on, although multitudes of other metropolitan "scandals" might easily be cited—antiquated defects in respect of which our great city lags behind all the rest of the civilised world. Oh, yes; I am quite prepared for your retorting that "Two blacks don't make one white." Certainly not; but it is mere fairness when we condemn one thing, to recognise that there are others equally bad which still remain unreformed. Ah! but, you say, those other things are very difficult of remedy and take a long while to improve; besides, efforts are being made to put them right by degrees and in course of time.

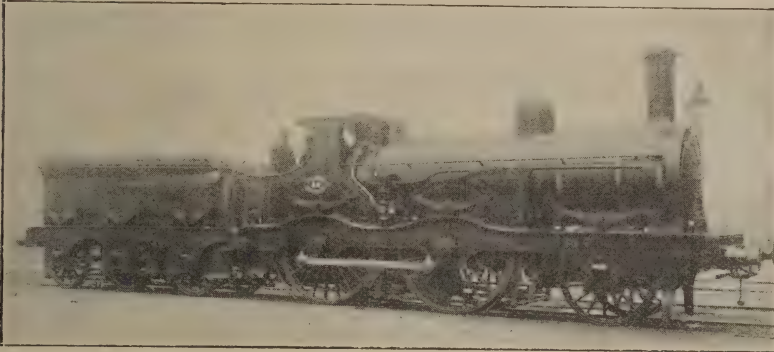
Just so! And the case is the same with Ludgate Hill Station; indeed, "more so," for if the public bodies of such a city as London find reform so difficult and tedious of accomplishment, how much more must be the difficulty when a Company, which hitherto has suffered under a long course of financial adversity, has a task to undertake which is in reality one of singular difficulty! Let me briefly review the situation as it stands.

In the first place it must be borne in mind that Ludgate, like the old London Bridge Station of the South Eastern Railway now so excellently rebuilt, was originally a terminus. The London, Chatham and Dover began by having a transpontine terminus for London City, as did the London, Brighton and South Coast at London Bridge and the London and

especially those who arrive and depart daily at and from the City. If they have once got into the way of using one particular London station they will persist in going on using it for that reason alone. It is not easy to tempt them even into a better one, and the bare idea of walking 200 yards more to the station is unutterably loathsome, whatever the resultant

advantages might be. Thousands of people had acquired the habit of going from Ludgate Hill to their homes in the numerous suburban localities opened up by the Chatham line; so they were determined to do so still at all costs.

And there is much to be said on their



LONDON, CHATHAM AND DOVER LOCOMOTIVE
No. 45.—ONE OF MR. MARTLEY'S OLDER EXPRESS ENGINES
Cylinders, 17in. by 24in.; coupled wheels, 6ft. 6in.

South Western at Waterloo; where both of the latter still remain. But soon the Chatham and Dover line was extended past the Blackfriars terminus across the river to a new terminus near Ludgate Hill. Next came the double extension northward across that street, the one to the permanent terminus at Holborn, the other down a steep gradient of 1 in 37 to Snow Hill, and thence by a bifurcation to join the Inner Circle of the Underground Railway at Farringdon Street and Aldersgate respectively. Lastly, a widening of the line approaching London and a second bridge over the Thames at Blackfriars gave the Company another station, both terminal and wayside, partly situated above the river, but fronting to the south side of Queen Victoria Street, and known as St. Paul's.

With St. Paul's and Holborn and Snow Hill Stations, all available within a radius of less than half a mile, it might not unreasonably have been imagined that Ludgate Hill would be of small importance and, perhaps, might be dispensed with all together. But railway travellers are the most conservative of people,

side. There can be no doubt at all that Ludgate Hill Station occupies a site of incomparable convenience to a large section of the busy class of Londoners. Holborn and St. Paul's are very close at hand, but still they are a little farther off, and are not quite so accessible either by omnibus or on foot. Moreover, the trains of the Metropolitan Extension service of the Chatham line, which are so extensively used by this numerous class, do not go to Holborn or touch at St. Paul's, and so Ludgate becomes to those travellers a necessity.

I come now to the two important functions which Ludgate Hill must always—and properly—fulfil. One is that of the chief City station of the Greater Southern Circle of the London railway system. People bound for the Chatham and Dover main line, or for the Crystal Palace or Greenwich line, can use, and may reasonably be made to use, the Holborn and St. Paul's Stations. But City passengers bound for stations on the Metropolitan Extension line, which forms a semi-circle round South London from Ludgate Hill

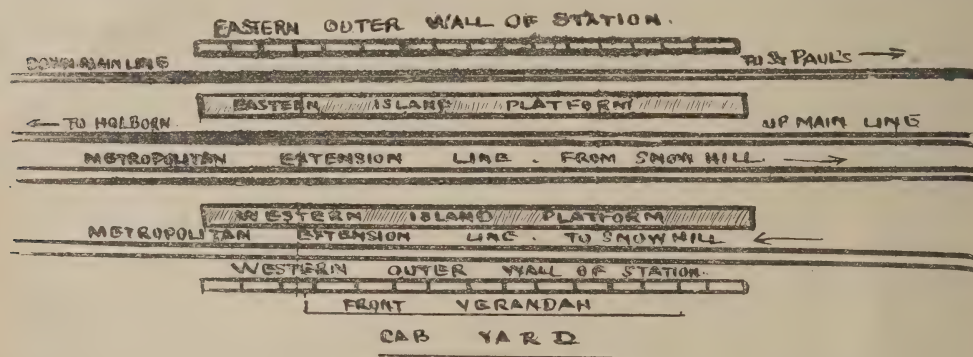
to Victoria, cannot use with equal convenience any station but Ludgate. The second function is that of a wayside halt on the very important line of communication between the North of London—indeed, the whole of Great Britain north of London—and the entire South of England. Ludgate Station is virtually the point at which the routes from all these directions converge—the gate through which the traffic to and from all those places must necessarily pass. And this traffic uses, almost exclusively, the western up and down track through Ludgate Station.

And now let us see for a moment what that traffic is. It comprises (1) the entire Metropolitan Extension service between Moorgate

South Eastern service between London Bridge and Great Northern stations.

All this traffic has to pass through Ludgate Station on virtually a single road each way. Is it wonderful that inconvenience and difficulty and even danger should result, especially when one island platform has to do duty for the whole of that traffic *both* ways?

How to relieve the excessive and peculiar congestion without interfering with the public convenience and freedom of choice as to the station used has long been a problem of the most puzzling kind. The irresponsible amateur critic is quick to exclaim airily, "Oh, it's quite easy; you have only to buy up the adjoining property and extend



PRESENT GROUND PLAN OF LUDGATE STATION

Street and Victoria; (2) the London, Chatham and Dover through service from Midland stations to Victoria; (3) the London, Chatham and Dover through service from Great Northern stations to Victoria; (4) the Great Northern through service from York Road and stations beyond to Victoria; (5) the Midland through service from Kentish Town and stations beyond to Victoria; (6) the London and South Western services from Ludgate Hill to Richmond and Tulse Hill respectively; (7) the whole of the very heavy coal and goods traffic from the North of England and Scotland by the Great Northern Railway to the South of London and of England; (8) the similarly heavy coal and goods traffic of the Midland Railway from the North and the Midlands to the South of England; (9) the

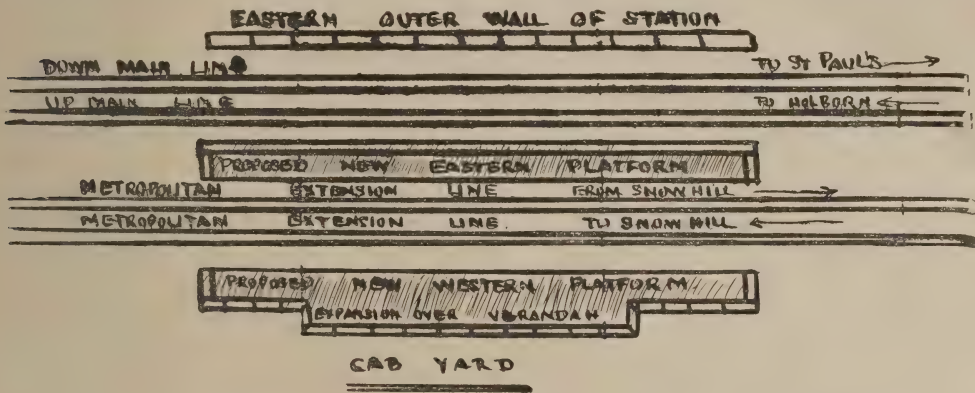
the station." But, unluckily, Ludgate Station is hemmed in to such a degree that extension is well-nigh impossible, save at a cost so enormous as to be absolutely prohibitive. Let anyone stroll round the station and notice how many large business buildings abut upon it, and how terribly it lacks "elbow room" on all sides. Practically all outward extension is barred, save partially in one direction, as to which I shall have something to say later. For the present let us take it as a fact that the station area cannot be expanded.

Inside, at present, there are four lines of rails and two narrow island platforms. The eastern platform serves the up and down main line, which, coming from Holborn Terminus, passes through Ludgate Station and then on through St. Paul's Station to the South. The

western island platform has to accommodate all the rest of the traffic. Occasionally during a press of traffic a train belonging to the western platform is passed over to the eastern one, but that is the exception.

What is now proposed as a remedy is, first, to discontinue stopping any up main line trains at Ludgate Hill, and shortly to do the same as regards all the trains from Holborn to St. Paul's and the South. This will cause no real inconvenience, as both those stations are so easily accessible and near together. In fact, the stopping of main line trains at Ludgate Hill has been an absurdity ever since

present used for the whole of the traffic classified under the nine different heads already set forth, will be abolished, and that two new non-insular platforms will be substituted. That, at any rate, ought most certainly to be done. I assume also that the two through main lines will be partitioned off by a wall or boarding from the new eastern platform. I imagine further that the new western platform will similarly be placed with its "back against the wall." If this plan be adopted, and the ends of each platform closed in so far as practicable, as much will be done as is possible to mitigate the terrible cold draughts and biting



GROUND PLAN OF LUDGATE STATION AS NOW SUGGESTED.

Holborn and St. Paul's Stations were available. Later the eastern island platform will, I understand, be done away with entirely, the up main line being slewed and laid close alongside the down at the usual distance apart. It may be taken for granted that a new roof will be among the needful reforms effected, and if so-it could easily be designed so as to dispense with the row of rough wooden columns which at present stand in the way of such slewing. At the time of my writing this the precise details of the new plan are still wholly undecided. I shall therefore proceed to point out what *can* be done with comparative ease and cheapness toward making Ludgate Hill Station relatively safe, convenient, and comfortable.

For one thing, I take it for granted that the western island platform, which is at

blasts which are at present so distressing and injurious to passengers compelled to wait on the exposed island platforms. This, moreover, will minimise the danger of people being pushed off the platforms on to the rails, a very imminent peril at present, while a line of rails runs on each side of each platform. Under the method suggested there will at least be a wall on one side of each platform to "lean one's back up against" during the periodical crushes which occur regularly twice a day. The rough sketch plans appended will make my meaning abundantly clear.

Well, under this arrangement we should get a wayside station of the ordinary type with two platforms, each backed by a wall or firm partition, and with the customary pair of rails between them, access being given to the train or platform on the side on which the train is

running; that is to say, each platform would be on the *left*-hand side of the train, according to the usual system. The pair of through main lines would be wholly separated and boxed off, so that trains could run through at any speed desired. All this would be an immense improvement.

But I come now to my promised suggestion as to one possible mode of expansion. I said that this was precluded on every side but one. That side is the western one, fronting the cab-yard. I do not see why the western wall of the station should not be thrown out some feet into the cab-yard. It would only be necessary to extend the upper story, and this could be carried over the footpath, so that the western platform would form a roof to the path in place of the existing verandah. Several feet of platform depth would thus be gained at a minimum of expense, and this would make Ludgate a really good and convenient station.

But there are two or three things which might also be done in the way of facilitating the traffic. It should not be impossible to arrange with the London and South Western Company that their Richmond and Tulse Hill trains, which make Ludgate Hill their terminus and cause most troublesome blocking through having to run on to Snow Hill for shunting, should make St. Paul's their terminus instead. This would avert much serious delay and obstruction now constantly experienced at the busiest hours of the

day. It might also be feasible to divert to the main through line some of the Great Northern and Midland goods and mineral trains which now so often block the Metropolitan Extension lines on each side of the western Ludgate platform. They could diverge near the bridge over the river and rejoin the other line just north of Ludgate Station. The requisite

points and crossings already exist. This would only be desirable at particular times of the day when the passenger traffic is heaviest, but on such occasions it might afford some relief, and this also might abate in a small degree the frequent blockings at various parts of that difficult curved triangle which has Snow Hill, Aldersgate and Farringdon Street Stations as its three points. The present roof spanning the entire width of the station might well be dispensed with. A mere "umbrella" or verandah roof sheltering the platforms would fulfil all requirements, and no covering at all would be needed over the through main lines. Here a material saving of expense in upkeep might be effected.

By the adoption of some such general plan as this Ludgate Hill Station would be enabled to emerge triumphant from the condition which has so long been a misery alike to the passengers, to the railway officials, and to the Company itself, and might well become one of the best and most suitable, as it is one of the most important, wayside stations in the metropolis.

An alternative plan has been hinted at in



AN ENGINE STILL TO BE SEEN AT LUDGATE HILL
 "Scotia," one of Mr. Martley's Tank Engines, Nos. 95-100 class; cylinders,
 17in. by 24in.; coupled wheels, 5ft. 6in. diameter

the daily papers. It consists in abolishing the eastern island platform but retaining and widening the western one. That seems to me less advantageous than the other in every respect but one, viz., that possibly the alteration might be made with less disturbance of the traffic. That undoubtedly is a most important matter, and it can neither be ignored

nor slurred. Still, it would be a great pity to spoil the reconstruction, even if some temporary inconvenience should be occasioned by the adoption of a superior plan. By retaining the western island platform, although greatly enlarged, most of its drawbacks would also be perpetuated. There would still be the confusion caused by the mixing of two sets of passengers bound in opposite directions. There would still be the want of a "back" to the platform. There would still be the frightful draughts in the absence of back-wall and closed-in ends. So I earnestly hope that the other plan will be adopted.

One thing more I should like to suggest. The names of our railways and stations are often much too long. Life is short and time is money, so let us avoid waste of each by abbreviating all names as much as we can. Therefore let the reconstructed station be

renamed "Ludgate," and let the "Hill" disappear with other sad memories of the past.

I append illustrations of two different classes of locomotives often to be seen at Ludgate Station. (1) "Scotia," one of Mr. Martley's old tank engines, having 5ft. 6in. coupled wheels, and cylinders 17in. by 24in.; and (2) No. 45, one of Mr. Martley's express engines of the class which did all the best express work until Mr. Kirtley's bogie locomotives came out. The numbers of this class extend from 32 to 58, with a few minor differences of detail, No. 50, for instance, having 6ft. coupled wheels, and Nos. 32-43 having cylinders 17in. by 22in. The rest of the class have 6ft. 6in. coupled wheels, outside driving-wheel bearings and cranks, and cylinders 17in. by 24in. These two illustrations are reproductions of photographs by Mr. F. Moore, 9, South Place, Finsbury, E.C.



PERTINENT PARAGRAPHS

"Railways have rendered more services, and have received less gratitude, than any other institution in the country."—JOHN BRIGHT.



THE London and North Western Railway, in the forthcoming Parliamentary Session, seeks powers to construct a railway to Red Wharf Bay in Anglesea. This proposed line will follow a course almost similar to one of the earliest projected railways. An Act was obtained as long ago as 1812, under the title of the "Anglesea Railway," to build a line seven miles in length to Red Wharf Bay, which was to be a series of inclined planes. The Act was but the fifteenth granted for the construction of a railway, and some £23,000 was required to construct it, the Earl of Uxbridge and a Mr. Holland Griffith undertaking to provide the money. Now that the London and North Western Railway has the matter in hand it is likely to be completed. Even in the annals of railway construction—where lines are frequently projected many, many years before they are built—it will not be possible to find another railway built after nearly ninety long years of waiting.

* * *

Through the *laissez faire* policy of successive Governments the lack of facilities for efficiently dealing with the steamboat traffic at Dover have developed into a scandal. Times were when, no matter the state of the weather, the steamers to and from Calais and Ostend left and arrived at Dover daily according to schedule. But what has happened during the gales of the past month? The question of improving Dover Harbour has for many years been raised periodically in the House of Commons, and, although large sums have been voted and plans approved for a National Harbour at Dover, but little, if anything, has been done. One Government did get so far as to build a prison on the heights for the shelter of convicts, who were to provide the labour for the piers, etc., but the building still remains unoccupied, and is already falling into decay.

The Admiralty Pier is in the course of being lengthened, and every yard now added to it will lessen the force of the cross-seas which are now causing the difficulty between it and Jackson's Pier, the only part of the "improvements" carried out at Dover, and the cause of all the mischief in rough weather.

* * *

The South Eastern Railway, a private Company, have during the last year or two been spending large sums of money in strengthening and extending their pier at Folkestone, and, but for this fact, the service between Dover and Calais and Folkestone and Boulogne would have been on many days during the last few months entirely suspended. Private enterprise has in this instance enabled international business to be carried on. Now the South Eastern and Chatham and Dover form practically one system, great economy could be effected by conducting the whole of the Continental traffic from Folkestone—at any rate, whilst the present condition of Dover Harbour causes the Dover services to be liable to such frequent interruptions. When the National Harbour is completed the railways could return to Dover if they were not satisfied with Folkestone. The suggestion is worth serious consideration.

* * *

The Ostend boats, which are the property of the Belgian Government, have not made use of the South Eastern Railway Pier at Folkestone, and consequently the passengers crossing by them have had a very unpleasant time, as long as twenty-six hours on some occasions elapsing between the passengers going on board at Ostend and disembarking at Dover. Why, under the circumstances, the Belgian steamers did not attempt to land their passengers at Ramsgate or Folkestone is a thing "no fellow can understand." After being 40 hours out from Ostend the passengers were, on Sunday, January 22nd, landed at Queenborough. Well, "better late than never!"

We publish below the menu of a little dinner that was given on December 29th by the popular General Manager of one of our leading railways to some of his brother officers and others. The dinner took place at the hotel attached to the terminus of the railway, which hostel, under the recently inaugurated management, has, by the excellence of its cuisine, wines, and service, attained a place in the very front rank of railway hotels. The menu was as follows:—

MENU.

Hors d'Œuvre.

SOUP.

Green Turtle.

FISH.

Native Oysters au Gratin.

ROASTS.

Prairie Chicken Larded. Bread Sauce.
West American Wild Turkey. Cranberry Sauce.
Norfolk Turkey.

Saddle of American Forest Venison with Jelly.
Roast Fresh Bear Meat *à la* Grand Trunk. Port
Wine Sauce.

American Red-head Ducks (Wild Celery Fed).
American Woodcock.
Royal Baron of Beef from the Home Farm of Her
Majesty the Queen.

SALADS.

Lettuce Salad. Endive Salad.

VEGETABLES.

Saratoga Chips. Baked Sweet Potatoes.
Stewed Tomatoes. Hominy.
String Beans. Stewed Celery.
Mashed Potatoes. Plain Potatoes.

SWEETS.

Frozen Pudding. Plum Pudding. Mince Pies.
Ramequins with Parmesan.

Dessert.

29th December, 1898.

Some did not quite appreciate the point as to the Roast Fresh Bear Meat *à la* "Grand Trunk," until they ascertained that it was in recognition of the presence at the gathering of a gentleman connected with the Canadian railway so named.

* * *

A correspondent has raised a nice point as to whether the stop signals beyond the "starting" signal should be called the "advance" or "advanced" starting signal. As the query was raised in consequence of the former word being employed in the RAILWAY MAGAZINE, we inquired of a well-known signal superintendent for his views on the matter, and he is in favour of "advance." In support of his opinion this gentleman writes:—
"The term 'advanced' starting signal would

rather indicate a starting signal itself, whose position had been advanced." By reference to the Service Time-Books, Appendices, and Book of Rules of many railways we find both words used, although "advanced" appears more frequently. It would be interesting to know the opinions of other leading signalling officers on the point. Whilst discussing the nomenclature of signals, it is of interest to note that on the London, Chatham and Dover Railway the "home" signal is always described as the stop signal, and never by its generally known title of "home" signal.

* * *

The question of the general overcrowding of suburban trains is being well ventilated just now, and the directors of the Great Northern Railway (on which line it is alleged the overcrowding is chronic and most severe) received a deputation representing the season ticket holders on January 19th in connection with the agitation. If the published reports of the interview are correct, neither the statements made by the directors nor the General Manager were very much to the point. Thus Mr. Fison, M.P., one of the directors, in extenuation of the unpunctuality of Great Northern suburban trains, is reported to have said, "They were not controllers of other systems from King's Cross (*sic*) to Broad Street." As there are no trains between the two points, the statement lacks intelligibility; whilst the North London Railway service from Broad Street to Finsbury Park could scarcely have been referred to, as, although these trains and the Great Northern from King's Cross are timed to arrive at Finsbury Park simultaneously, it is well known that quite 80 per cent. of the North London trains arrive at that station before the Great Northern. Then Mr. Steel is credited with stating that "the Great Northern accommodation was not insufficient if the traffic were spread over the day." It is not likely such a remark could have been made, as the General Manager is too sensible a railway officer to have made such a childish statement. It would have been as sensible to have stated that the whole of the traffic could be worked by one train if the time allowed were long enough. The possibility in both cases is evident, but "if" stands in the way of probability. Mr. Steel stated that sixty up trains passed through Finsbury Park between 8 a.m. and 10 a.m., and that it was impossible to work more trains over the line between those hours. Of these,

thirty-nine go to King's Cross (some of them proceeding thence to Moorgate Street), and twenty-one over the North London Railway to Broad Street. Dismissing the latter from our calculation, as they are not under the control of the Great Northern Railway, and only dealing with the trains to King's Cross and beyond, we find that, as there are two up roads, the time between each train averages over six minutes. Now it is evident that three minutes' intervals between such trains are ample, and therefore the number of trains between Finsbury Park and King's Cross could readily be doubled. The working of the trains is ample evidence that more trains could be worked, since goods trains are frequently passed through Finsbury Park Station during these two hours, causing delay to the passengers' trains.

* * *

The Northern lines could learn a useful lesson from the railways south of the Thames as to providing more accommodation during the busy hours. The Southern lines add additional carriages to their trains when the traffic is heaviest, but this is not done by the companies north of the Thames, which always conduct their suburban service with "block" trains of the same length. If these trains were made shorter during the slack hours of the day a great deal of useless train mileage, wear and tear of rolling stock, and fuel would be saved; whilst when the passenger traffic is heavy the system in vogue south of the Thames should be adopted and additional carriages added. It might be urged that the trains cannot be made longer because the platforms are unable to accommodate longer trains; but the London, Chatham and Dover long "block" trains, to which additional coaches are added morning and evening, use the same platforms at Aldersgate Street, and a similar one at Moorgate Street, so that this reason is scarcely sufficient. Another improvement that the Great Northern could effect in their evening down suburban service is by booking the trains to run through from Farringdon Street to Holloway. They are usually full at the former station; three or four minutes would be saved on the journey, and the King's Cross passengers could be conveyed by relief trains from the local terminus. By adopting this suggestion the inconvenience of overcrowding would be almost entirely eliminated, as it is at King's Cross (Metropolitan and Suburban Stations) that the evil happens.

We frequently hear that the "supply creates the demand," but in the case of liquid locomotive fuel—a waste product—the demand is now so large that the price of the liquid fuel has considerably risen, and instead of it being cheaper to fire locomotives with oil, this fuel is at the present time more expensive than coal. Hence the reason that many of the liquid fuel engines are at present burning coal.

* * *

At the present time there appears to be a good opening for another firm of British locomotive builders, as according to reports the half-dozen or so firms who undertake the construction of railway engines are so fully engaged that delivery of engines cannot be promised for very many months, and consequently those railways whose officials have not kept the supply of locomotive power up to the growing requirements of the traffic have had to look abroad for help. Years ago, when the railways did not attempt to supply their own engines, there were numerous firms in the business, and these supplied not only the British railways, but practically the whole world except the United States. As the railway system became more complete, and the railway companies commenced to construct their own locomotives, the work for private firms fell off considerably, and many of them retired from the business. Such enormous capital is required to properly run a locomotive factory that only very few capitalists can enter the business, but if some of them will find the money to equip the works there is at the present time plenty of business to be done. If a certain well-known locomotive superintendent were engaged to run the works there could be no doubt as to the success of the venture.

* * *

The old established business of Messrs. John Penn and Sons, Ltd., has been taken over by the Thames Ironworks Company, Ltd., of which gigantic organisation the well-known philanthropist, Mr. A. F. Hills, is the head. Penns were famous for marine engine construction, and, in addition to other railways, the Channel steamers of the South Eastern Railway Company were always supplied by them. The successful Thames Ironworks Co. will therefore now be in even closer touch with the railways than previously. As stated in the preceding paragraph, there is a good opening for another firm of locomotive builders, and as

the Thames Ironworks Co., by absorbing the engine works of Penn and Sons, is enlarging its business operations, it might also commence building locomotives, especially as the wealth of the undertaking is proverbial.

* * *

It may be commonplace to say the influence of railways is ubiquitous, but it is without doubt a positive fact that railways enter into most unexpected matters. At first blush who would expect a railway to be concerned in the great ritualistic controversy now agitating the public? Yet the Protestants are congratulating themselves that the London and South Western Railway is doing its quota to stop abuses in the Church of England. The railway seeks power to acquire the site of All Saints' Church, Lambeth, which is stated to be one of the most ritualistic in England. It is reported that if this church is pulled down the practices obtaining there will not be permitted elsewhere.

* * *

The Leek and Manifold Valley Light Railway Company commences under most favourable auspices. Out of a total capital of £35,000 no less than £10,000 is an absolutely free grant from the Treasury, whilst the Staffordshire County Council lends another £10,000 at a very low rate of interest, leaving only £15,000 to be subscribed for, applications for which can now be received. The railway will pass through valleys of unequalled beauty and attractiveness. Amongst many points of interest may be mentioned Thor's Cave at Wetton, the disappearance underground of the Rivers Hamps and Manifold near Waterhouses and Wetton respectively, to reappear united at Ilam, the Ecton Mines, the village churches of Waterfall, Grindon, Butterton, Warslow, Alstonefield, and Hartington, and the picturesque remains of Throwley Hall. The beautiful upper reaches of the River Dove, comprising Longnor, Hartington, Beresford Dale, and Dovedale are within very easy access of the railway, which will provide the most convenient way of visiting the district from the Staffordshire side. The Hamps and Manifold Valleys are fully equal in grandeur to the famous dales of Derbyshire, but, owing to the lack of railway access, are at present practically unknown. The line will bring this district within easy reach of the Potteries and adjacent towns, possessing a population of over 250,000. The railway has been incorporated by an order of the Light Railways Commissioners for the

purpose of constructing and equipping a light railway from Hulme End, near Hartington, through the Valleys of the Manifold and Hamps to Waterhouses, where a junction will be effected with a railway of the ordinary gauge, about to be constructed and worked by the North Staffordshire Railway Company, which will join the Churnet Valley line of that Company at a point near the important and growing town of Leek. The length of the line will be eight miles and eight chains, and the gauge 2ft. 6in. There will be stations at Hulme End and Waterhouses, and the train will stop at all convenient points of access. The motive power will be steam or electricity, and the coaches will be modelled on the tram system, particular attention being given to the requirements of excursionists, and their desire to see the country through which they pass. The fact of this line being one of the first light railways in the United Kingdom established on the narrow gauge under the Light Railways Act of 1896 will no doubt create of itself special interest, and induce sightseers in like manner as the Festiniog Railway in North Wales. It is proposed to run the narrow gauge line alongside the North Staffordshire Railway at Waterhouses, so that transshipment can be effected in the most convenient and economical manner. The railway certainly appears to give promise of success, whilst an advantage to investors is the fact that the Company is incorporated with limited liability, an unusual feature with railways. Mr. E. Challinor, of 10, Derby Street, Leek, is the Secretary.

* * *

Our Irish contemporary, "L. S. D.," in a recent issue gave a *résumé* of the Irish railways during 1898, from which we extract the following:—

The Irish railways are progressive. It is only when one halts to look back upon the work accomplished during the short period of a year that this truth is forcibly illustrated. The railway companies have opened three admirable hotels during 1898, and purchased two others. The Midland Great Western opened their new hotel at Recess; the Belfast and County Down, a magnificent building at Newcastle; and the Belfast and Northern Counties, at the Company's newly constructed terminus at York Road, Belfast. The latter building will be exceptionally convenient for many besides the tourist class. The Great Northern Company purchased the Mourne and Woodside hotels at Rostrevor. Those who travel for business or pleasure will be equally convenience by the acceleration of speed by forty-five minutes, and the addition of third-class carriages

to the London and North Western Irish mails. The Midland Great Western Company has maintained its reputation for liberality by affording facilities to third-class passengers to travel by the limited mails on their system. The Great Northern of Ireland has yet to be induced to follow the same line of policy. It is only a matter of time. The longer the inevitable day is put off the more likely are the Company's directorate and management to expose themselves to criticisms that cannot be ignored as unjust or indefensible. A station at Clontarf was long asked for, periodically declined, and finally opened in 1898, on the 1st of April.

It must be admitted that the Great Northern Company were the first to furnish their principal trains with dining-cars. During the year just closed the Great Southern and Western Company adopted the innovation, and we hope to see the facility thus offered the public so largely availed of that the number of dining-cars on the trunk lines of this country may be largely increased. There is not the same necessity for such accommodation in Ireland that there is in Great Britain and elsewhere, but it is an undoubtedly desirable convenience for many people who may be induced to travel in a higher class on account of this and some other luxuries introduced in recent years into the equipment of the first and second class carriages of our leading railway companies. Time being convertible into money, the improvements effected in passenger rolling stock are really equivalent to a reduction—a very substantial reduction—of fares, especially because the companies derive no immediate gain from these improvements. As a matter of fact, it is doubtful if dining-cars are likely to yield the railway companies a satisfactory return until they have been some years on the roads, and the general public has come to appreciate their very great advantages.

In the summer months the Great Northern Company adopted a system of low rates for packages of country produce sent to town householders. This practice was introduced on some of the English lines some time ago, and was found to work satisfactorily. We hope it may be productive of revenue to the Great Northern Company. It is certainly to the advantage of residents in populous centres like Dublin and Belfast.

* * *

The following account of a smart piece of work which was performed on the Nord Railway of France may perhaps prove of interest to our readers. On December 30th last the midday mail packet from Dover reached Calais Pier at 2.40 p.m. (French time), being fifteen minutes late. A rough sea and a heavy advance portion of the night Indian mail were jointly accountable for this state of affairs. It was not until 3.20 p.m., or twenty minutes after the advertised time of departure, that the express for Paris left Calais Pier Station. The train consisted of sixteen ordinary four and six wheeled Nord carriages, one six-wheeled P.-L.-M. coach for Vintimille, one six-wheeled Italian vehicle for Milan, and two brake-vans. There were some 300 passengers,

this large number being due to the fact that all Continental services had been much interrupted by severe gales during the two preceding days. Notwithstanding all this, the train came to a standstill opposite the last signal-box (which is practically at the end of the platform of the Paris terminus) at 7.1 p.m., and actually drew up in the station itself at 7.6 p.m., or only six minutes late. The following is the log of the train:—

Miles.	Calais (Gare Maritime) dep. ...	3.20 p.m.
1½	Calais (Ville) dep.	3.25 „
103½	Amiens, arr.	5.20 „
	Amiens, dep.	5.24 „
185	Paris (Nord) arr.	7.6 „

Time, 3hrs. 46min. Inclusive speed, 49.3 m.p.h. Time from Calais (Ville) to last signal-box, 3hrs. 36min. Distance from Calais (Ville) to last signal-box, 183½ miles. Speed (excluding stop at Amiens), 52.4 m.p.h. Bad signal checks at Creil and Chantilly.

Engine No. 0.531, built by the Société Anonyme des Constructions Mécaniques d'Alsace-Lorraine, at Belfort, in 1894.

The Calais-Rome and Calais-Méditerranée expresses are advertised to beat the above figures, but they seldom do so in actual practice, and are, moreover, exceedingly light trains, as between Paris (Nord) and Calais they frequently consist of two sleeping-cars only, equal to about fifty tons.

* * *

Improvements for the conveyance of luggage have just been introduced on all French railways at the instance of the Minister of Public Works. Under these new regulations, personal luggage will be accepted at all stations, and can be forwarded to any other point of France, on no matter what railway system. There will be no need to produce a railway ticket for the destination to which the luggage is to be sent; and if transit from one railway station to another is necessary, as is the case on a journey from Calais to Paris, and thence to the South, this will be attended to by the railway authorities. It is true the charges for this service are slightly higher than ordinary parcels rates, but the convenience is considerable, and the railway companies are, moreover, bound to forward the articles by the first passenger train. Travellers arriving in France, at Calais, Boulogne, or Dieppe, can now, therefore, register their luggage direct through to Nice or any other French town, and, whilst not having the bother of attending to its passage across Paris, can be certain of its arrival at its

destination without any delay. This improvement has caused much satisfaction among French travellers.

* * *

It is amusing to read the effusions of those who have nothing better to do than to write to the papers on things they do not understand. Unpunctual trains provide a fertile subject for those afflicted with *cacoethes scribendi*. The discussion of the meaning of the Railway Clearing House rules has been imported into the correspondence, together with the question whether engine-drivers should make up time. To prevent any doubt on this latter point we quote the instructions from the appendix of a well-known company: "Drivers must not absorb in their running any time not occupied at stations." "When trains are running late both drivers, guards, and station staff must all unite in their efforts to make up for the time lost, and try and ensure punctuality." Clearer, or, for that matter, more sensible, directions than the above cannot be wanted to convey to men of average sense their duty as to making up lost time.

* * *

There are not many lines that have so much difficulty to get rid of empty trains as the South Eastern has in connection with Charing Cross during the afternoon. Several important up trains arrive during this period, and as most of the platforms are at this time fully occupied with the many down trains that depart during the afternoon, the empty coaches have to be sent off to Bricklayers' Arms. To reach this place necessitates a back shunt across two up roads at the junction, which is likely to cause delay to both the South Eastern and the London, Brighton and South Coast Railway Companies' trains; altogether, therefore, considering these drawbacks, the traffic is worked with credit to those concerned. The South Eastern Railway is busily engaged in constructing about six miles of sidings at Hither Green Junction, and these are expected to be opened for traffic in the course of the next few weeks. When they are brought into use still further improvements in the working of the trains will be effected.

* * *

A writer in an American engineering periodical, discussing the history of the sleeping-car, makes a serious mistake in stating that the first "sleeper" was built in October, 1856.

Being an American, he ought to have better information on the subject than us, especially as we get ours from a United States journal, published during the autumn of 1838, the "Baltimore American," which says:—

The introduction of the newly-invented sleeping-cars on our railroads makes that kind of travelling almost perfect; all that is wanting now is a dining-car. The sleeping-cars will soon be placed on the railroad between this and Philadelphia, so that travellers leaving here in the 7 o'clock train may go to sleep in this city and not be disturbed till they reach Philadelphia. These cars are fifty feet in length, and the seats, which are sideways, can by a simple movement be converted into berths; in each car forty-eight passengers can be accommodated with berths.

It will be observed that the American writer of railway literature makes his history of the sleeping-car commence eighteen years after the system had been inaugurated, and has left it to the RAILWAY MAGAZINE to supply the details of the initial efforts to provide "sleepers."

* * *

The mistake in the amount of the South Eastern Railway dividend caused a considerable flutter on the Stock Exchange, a good many speculators grumbling. It was, however, absurd for a daily paper to make such a senseless remark as "the increase in the dividend has been received with disgust." Now the only people really interested in the dividend are the shareholders; who naturally like to receive as large a dividend as possible, and would, therefore, receive the news of the increase with pleasure rather than with "disgust." The daily paper that spoke of "disgust" apparently thinks railways are run for Stock Exchange purposes instead of for the benefit of the shareholders.

* * *

The instructions contained in the Working Time-Tables of some of our Colonial railways appear rather strange to us, but, of course, the circumstances are very different in Victoria to those obtaining in this country. Where only three or four trains pass every twenty-four hours it is possible for a station to be in charge of a woman. The following instruction relates to the working of "women-in-charge" stations on the Victorian Government Railways:—

When trains travelling on a staff ticket are stopped at women-in-charge stations provided with fixed signals, the guard will be held responsible for

placing the signal at danger. The woman-in-charge to pull the signal "off" ten minutes after the train has left. Where, however, the woman-in-charge is physically unable, or no fixed signals are provided, the guard must see that the woman understands that a red flag must be shown, and kept exhibited for ten minutes after trains leave. The names of stations on the various lines where a woman is in charge are printed in italics.

At some stations in Victoria no one is in charge until a passenger arrives, when he becomes "monarch of all he surveys" until the welcome train arrives.

* * *

There is an impression abroad that unless a railway is a large one—measured by the number of miles owned or worked—it is not entitled to much consideration, and is, in fact, a rather secondary affair.

But the mileage is quite an inaccurate standard by which a railway should be judged. Indeed, it requires far greater skill to efficiently manage a smaller concern where the appliances are neither so numerous nor down-to-date as those found on a wealthy line. Everyone will allow that a railway with, say, 300 miles of line on which, in six months, 4,000,000 train miles are run and 35,000,000 passengers are conveyed, is entitled to greater credit for accomplishing the feat than is another railway 1,500 miles in extent, which during the same period only conveys 19,000,000 passengers, and runs but 12,000,000 train miles. In some places credit is already being given upon results obtained.

* * *

The claims of the rival routes to the Continent interest some of our readers as much as do those of the different automatic brakes; we therefore give below the returns for 1898, compared with those for 1897. It will be observed that Folkestone was again in the van with regard to the increase of passengers carried, the number exceeding those of the previous year by over 23,000. *Viâ Dover* the increase was under 8,000, whilst *Newhaven* could only muster 3,000 beyond the previous year. By the new arrangement between the South Eastern and Chatham and Dover Railways the competition is now reduced to that between these joint lines and the London, Brighton and South Coast Railway. What steps will Mr.

Gooday, with his experience of Continental traffic, adopt to attract traffic to his route?

	1898.	1897.
<i>Viâ Dover and Calais</i>	275,268	267,412
<i>Viâ Folkestone and Boulogne</i> ...	133,315	110,432
<i>Viâ Newhaven and Dieppe</i> ...	167,212	164,190

* * *

Railway Porter (at Coldstream Station): "You have missed the train to Alnwick, ma'am, and you will have to wait at this station seven hours and a quarter."

Old Lady (who is nervous on the railway): "Well, thank goodness, I'm safe till after tea-time, anyway!"

* * *

Porter Tompkins had been fighting. There could be no doubt of that. His eyes were marked with that delicate tint which is well known in pugilistic circles.

The stationmaster was severe, and, after Tompkins had been duly lectured for twenty-five minutes, he blurted out:—

"Others do it besides me—I ain't the only one."

Now the standard at C—— was high, and the boss, duly wroth at this barefaced statement, sharply said, "If, Tompkins, you can tell me of any other fighting that has been going on I'll try and overlook your conduct."

"Well, sir," said Tompkins, "only yesterday I saw the station signal—*box*."

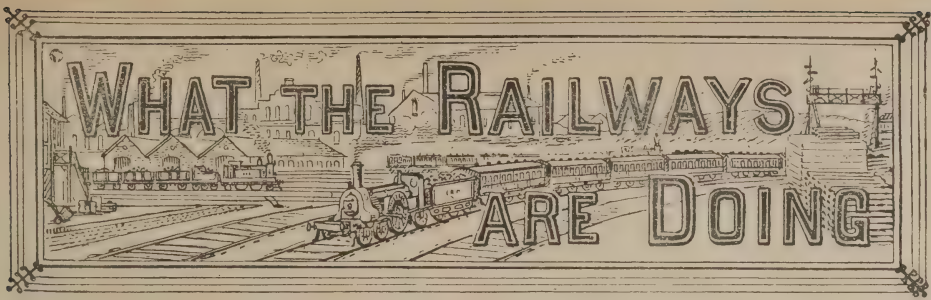
* * *

Railway readers qualifying for their B.Sc. degree will be interested in the following paragraph, reproduced from the "Humorous"—we mean the "*Science Notes*" column of a daily contemporary:—

COST OF STOPPING A TRAIN.

People often wax impatient because express trains cannot be stopped at some unimportant little station at which they wish to alight. They should consider the cost of satisfying their whim. A train going at the rate of sixty miles an hour can be stopped within one hundred and twenty yards from the first application of the brake. Now, enough power is lost to carry this same train fifteen miles over a plane surface. First, there is the momentum acquired by the train flying at this remarkable rate of speed; then the loss of steam in applying the brakes; and, lastly, the extra amount of coal to compensate for all these losses. For all of which impatient passengers would not care to pay.





CALEDONIAN.

THE permanent station at Glasgow Central (low level) is now open, and the temporary station built three years ago is closed. The new

building, which has a frontage of 154ft. to Argyle Street, and 123ft. to Hope Street, is a one-storey structure of massive and ornamental design, with a huge dome at the corner, and canopies, carried on cantilevers, which overhang the footpath along the whole frontage. Communication with the high level station is obtained by a passage rising at a slope of one in ten, and leading to the distribution gangway over the Argyle Street entrance. A glass roof over the whole station admits sufficient light, and the appearance is brightened by the white brick lining of the walls. A restaurant, 60ft. long, adjoins the distribution hall. Separate entrance and exit stairways, each 19ft. wide, are provided, and the general arrangement of the station seems to indicate that the traffic will be conducted with the minimum of confusion.

The responsible officers of the Caledonian Railway Company believe that their screw couplings are sufficiently strong to hold the vehicles of a train securely together, and have now ordered that the side chains formerly in use upon their passenger vehicles are not now to be used, but simply hung up at the end of the vehicles.

One hundred new engines are being built for goods and mineral traffic, whilst also two new third-class picnic saloons, beautifully finished, with the most modern conveniences, and the under-frame supported by bogies, have just been constructed.

CAMBRIAN.

Mr. Denniss is still to the fore. The Cambrian Railways have commenced to issue 1,000 and 500 mile tickets at a charge of £5 5s. and

£2 17s. 6d. respectively. The tickets are issued in the form of a book of coupons, each coupon representing a mile, and these have to be exchanged at the booking-office at the starting station for a single or return ticket as required by the passenger. The coupons can also be made use of in part payment for through tickets to other companies' lines. Books of certificates are also issued authorising the use of the coupon book by the purchaser's family, guests, or employés. The cost of the tickets, which enable the purchaser to travel first class, and are available for one year from date of issue, works out at about 1½d. per mile.

Consequent upon the resignation of Mr. H. C. Corfield, the Board of the Cambrian Railways Company have appointed Mr. J. Parry-Jones to the position of Solicitor to the Company, the appointment taking effect from January 1st.

CHESHIRE LINES.

Passengers and others using or passing through the new Northwich Station (joint Cheshire Lines and London and North Western) have greatly admired the new roof, which makes the interior of the station one of the lightest known. The work has been carried out by Messrs. Helliwell and Co., under their well-known system of invisible glazing, and despite the tremendous gales of the past month, no hitch has occurred. Messrs. Helliwell and Co. appear to be making rapid strides in railway and general work, under the management of Mr. E. B. Podmore, the managing director, and Mr. G. E. Ryland, the efficient secretary.

CITY AND SOUTH LONDON.

The progress with the Moorgate Street extension has been uninterrupted during the past six months; both tunnels are completed from the junction with the present line at the Borough (under the Thames) to Moorgate Street Station, and the three underground stations are

almost finished. The shafts are ready for the lifts, the erection of which has already been commenced. The laying of the permanent way is also well advanced, and the subway communication between the Lombard Street Station of this Company and the Bank Station of the Central London has been constructed. The station buildings on the surface at Moor-gate Street, Lombard Street, and London Bridge will be commenced forthwith. The works of the extension from Stockwell to Clapham Common are progressing very satisfactorily, and it is anticipated that the line will be completed ready for traffic early in the autumn of this year. The erection of the new boiler and engine house at the depôt at Stockwell is proceeding rapidly, and will be ready for the erection of the engines in March.

The directors suggest that, as the works of the extension through the heart of the City have now been completed, it is necessary, in order to utilise fully this valuable portion of the line, that the remainder of the authorised undertaking, carrying the line to the Angel at Islington and thus bringing in the traffic from the north as well as from the south, should at once be proceeded with, and steps have already been taken to secure the site of one of the three stations along the route. It is therefore proposed to let the contract for the works as soon as favourable arrangements can be made. It is anticipated that this portion of the railway will be constructed at a very moderate cost, and can be worked economically with power supplied from the generating station at Stockwell.

In order to further facilitate and economise the working of the City and Brixton Railway, which, when completed, is to be leased to the City and South London Railway, it has been arranged that, in lieu of providing a separate depôt for the Brixton Company, a short tunnel should be made, connecting that Company's line with the City and South London's depôt at Stockwell.

FURNESS.

Mr. Aslett has quite a number of well-chosen proposals for the improvement of the Furness Railway, but many of them cannot be carried out without Parliamentary sanction. This is being sought in the coming Session. Amongst the new facilities that are projected may be mentioned the providing of hotels and coaches by the railway, new and more convenient piers at Waterhead and Bowness-on-Windermere,

and the dredging of the lake around the piers, also the working of the curious little Eskdale and Ravensglass Railway by the Furness Railway.

GREAT CENTRAL.

The London extension is rapidly approaching completion, if the contractors are to be relied upon, and "wind, weather (of importance in railway construction) and other circumstances permitting," the formal opening will take place shortly.

A new station for the joint use of the Great Central and London and North Western Railways is to be built in place of the old one in Clegg Street, Oldham. The cost will probably be about £25,000, and it is estimated that it will take about a year to complete the work.

GREAT EASTERN.

Comparatively few people are aware of the immense goods and mineral traffic conveyed by the Great Eastern Railway. The coal traffic that reaches London by the Great Eastern line *viâ* Cambridge is increasing by leaps and bounds. Temple Mills sorting sidings between Lea Bridge and Stratford, the south-eastern boundary of the old Northern and Eastern Railway, are amongst the largest around London, and probably few equal them in the amount of traffic dealt with.

"Petrolea," No. 760, which, after a long period of service, has been for some time in the shop, has just resumed work. An important alteration has been made in her, she having been fitted with a new crank-axle with half an inch longer throw. The effect is to increase her piston-stroke from 24in. to 25in., and her nominal tractive force from 92.5lb. to 96.4lb. for every pound of effective steam pressure in the cylinders.

"Petrolea's" sister engine, No. 759, has been fitted with cylindrical oil tanks, instead of those formerly carried. Readers will remember that both engines have 18in. cylinders and 7ft. coupled wheels. No. 1007, one of the 7ft. single-wheelers, also has had her piston-stroke lengthened to 25in., with very satisfactory results.

GREAT NORTHERN.

In our issue of November, 1898, we noticed the erection of a train indicator board at Finsbury Park, but apparently the porters at this station are too lazy to properly attend to the working of the apparatus, as frequently no

board is shown, or, worse still, at times a wrong one is hoisted. This should not be allowed to happen.

The directors on Thursday, January 19th, received a deputation of eight season ticket holders on the subject of chronic overcrowding to which the suburban passengers are daily subjected. The matter is discussed in the "Pertinent Paragraphs" of this issue.

A new engine-house, to hold about forty engines, is being constructed on the up side, south of Hornsey Station.

Mr. A. Pigott, an old Great Northern Railway official, has recently died. He joined the Great Western Railway in 1846, but transferred to the Great Northern in its infancy in 1851, graduating in the service of that Company until he reached the post of Signal Superintendent, which position he held until his retirement in 1893, when he left Retford. He was well known in the railway world, having inaugurated the system of block working on the Great Northern Railway, and devised the whole of the signalling throughout the line.

GREAT NORTH OF SCOTLAND.

The Great North of Scotland Company has given instructions for ten new locomotives being built; they are also building at their works, Kittybrewster, Aberdeen, a new third-class saloon for the use of pleasure parties. Mr. Moffatt is evidently determined to make the line "bigger and better." Already plans have been prepared and contracts accepted for the construction of a new railway station at Inverurie. The building will be one storey in height and 227ft. in length.

GREAT WESTERN.

The Great Western Railway Company have entirely remodelled their public time-book, the revised edition being issued for January. Upon the cover are views of some of the places of interest served by the line. The type, which is entirely new, is exceedingly clear, and the style of the publication is thoroughly up to date. The Great Western is so large a system that the large map provided in the new time-book scarcely does credit to the extent of the line. If new, clear, down-to-date sectional maps, somewhat of the style of those formerly inserted in the Great Western Railway time-tables—only larger and clearer—were added, the book would be still further improved.

Thermometers are now fitted in all steam-heated trains as under:—One thermometer in the front brake-van. This thermometer is

taken as a guide to the outside temperature, and not as the temperature of the interior of the train, so that when the thermometer reads 50 deg. Fah. or above it is not necessary to heat the train by steam. A thermometer is also placed in the first compartment next to the brake-van, and another in the last compartment next to the rear van. These thermometers are indicated on the outside of the carriages by a brass pin-head on the door-pillar near the lock escutcheon, and show the temperature inside the train; but care must be taken to note if the windows of the carriages are open, or have lately been open, as in that case only the outside temperature will be shown. No steam is sent through the trains when the thermometers in the compartments read over 55 deg. Fah., and in no case are the guards to allow more than 60 deg. Fah. (or beyond the black line specially placed on the thermometers for this purpose) to be the temperature of the trains.

Mr. J. Dunster, the Marine, Dock, and Harbour Superintendent of the Great Western Railway Company, was on Saturday, January 21st, presented with a beautifully illuminated album by his colleagues in the General Manager's office, in which he so well filled the chief position for several years.

LANCASHIRE AND YORKSHIRE.

On the morning of January 13th, about five o'clock, an accident occurred between Heywood and Broadfield Stations. A goods train was travelling down the loop line when the driver ran through the buffer stops at the top of a steep declivity. The engine tumbled into the embankment, and the wheels became embedded in the soil. Fortunately neither driver nor fireman was hurt, but they had miraculous escapes. The impact was terrific, and several goods wagons were completely wrecked.

Mr. Stafford, the efficient General Manager, is to be congratulated that, despite the heavy increase in wages and traffic expenses caused by the shorter hours worked and the larger number of men employed, the directors of the Lancashire and Yorkshire Railway Company have been enabled to declare a dividend for the past half-year at the rate of $5\frac{1}{2}$ per cent. per annum, the sum of £22,000 being carried forward. At the corresponding period last year the distribution was at the rate of $5\frac{1}{4}$ per cent. per annum, and £21,000 was carried forward. No doubt Mr. Nicholson's great experience as Superintendent of the Line has also contributed to this satisfactory result.

LONDON, BRIGHTON AND SOUTH COAST.

The Croydon patrons of this railway are now allowed to travel from Victoria by the 8.50 p.m. train. We suggested this concession in our December, 1898, issue, and Mr. Gooday, with his well-known desire to give efficient services—in which he is ably seconded by Mr. Greenwood, the energetic Superintendent of the Line—saw the “sweet reasonableness” of our suggestion, and granted the concession.

Since the Speaker has taken up his residence at select Seaford, rumours have been rife concerning a daily through up and down train between that favoured seaside resort and the metropolis, performing the journey in 1½ hours. But although “the time is not yet,” doubtless the summer will see something very nearly as good as the Speaker looks for. Seaford, by the way, boasts of the most aristocratic golf club in England.

The directors of the London, Brighton and South Coast Railway have appointed Mr. Thomas Nigel Wylie to the position of Continental Traffic Manager, in succession to Mr. Victor Gérard, retired.

The cargo steamer “Angers,” plying between Newhaven and Dieppe, foundered towards midnight on Monday, January 2nd, close to the end of the western jetty at Dieppe, during a violent gale. The vessel was thrown against the jetty, part of which was destroyed, and in consequence of this all communication by signal with the shore end of the pier was interrupted.

The “Angers” was owned jointly by, and formed part of the fleet of steamers worked by the London, Brighton and South Coast and the Western of France Railway. She was built in France in 1890, was of 459 tons burden, and was commanded by Capt. Fournier, with a crew of fifteen, all French. The ship attempted to enter the harbour at midnight. The sea at the time was running very high, and, to the anxious onlookers from the shore, it appeared that the vessel would enter safely. As the “Angers” gained the entrance, however, to the surprise and horror of all, she turned at right angles to westward, running clean through the pier, foundering on the westward side. It is said that the catastrophe happened as the result of the steering gear breaking.

LONDON AND NORTH WESTERN.

During the frightful gale of Thursday night, January 12th, a section of the London and North Western Railway between Conway and

Penmaenmawr was the scene of an appalling calamity. The Chester and Holyhead Railway runs contiguous to the seashore almost the whole distance after passing Flint. The violent lashing of the waves put a tremendous strain upon the wall which protects the railway between Conway and Penmaenmawr. The wall at the west end of the Penmaenbach Tunnel gave way and left an opening. The water rushed in upon the railway, and washed away the ballast of both the up and down lines for about seventy yards, leaving the rails and sleepers without any foundation. The Company had placed two watchmen to patrol the stretch of line in the neighbourhood. The watchmen saw nothing of the sudden sweeping away of the wall, but were suddenly aware of a great gap, dimly visible in the darkness, and saw that a great portion of the embankment had been swept away. They immediately rushed to give an alarm, one to Penmaenmawr, where he was just in time to stop a Holyhead goods train, just ready to start, the other to the mouth of the Penmaenmawr Tunnel. There he could hear the sound of an express goods train from Manchester to Holyhead coming through the tunnel. He placed detonators on the line, and frantically waved his red lamp. The driver saw the signals, but there was not time to stop the train, which was going at the rate of thirty-five miles an hour. The brakes were seen to be applied, but engine and tender dashed on to the suspended rails, their heavy weight brought them down, and they toppled headlong over into the sea. The driver and fireman were precipitated into the water, and must have been drowned almost immediately. There were thirteen trucks and vans on the train, loaded with various goods. Eight of these followed the ill-fated engine, but five stopped short of where the line was demolished. The engine was found, when the tide abated, lying on the shingly shore flat on its side, with a length of wrenched-off rail curling under it. The locomotive was partially covered with *débris*, and was being washed by the surf. The tender having crashed down on the top of it was fixed almost at right angles. The machinery of the engine appeared undamaged, but some of the trucks were smashed and splintered, and lying in a confused heap of wreckage. The covered van had been shattered to pieces, exposing to view its contents of hampers and boxes. Some of the fish-vans clung to the suspended rails which had not given way.

On Sunday, January 22nd, a large break-down gang, equipped with the necessary appliances, succeeded in raising the locomotive and wagons from the foreshore. The engine, which had been damaged both in falling and by the action of successive seas, was removed to Crewe. One or two of the wagons which fell contained barrels of stout, and these, curiously enough, were found intact.

On the afternoon of Sunday, January 8th, about forty feet of the well-known long bridge running from Crewe Railway Station into the London and North Western Railway works gave way, falling with a great crash on the main line to Holyhead. A number of wagons underneath were destroyed, the permanent way greatly damaged, signals smashed, and the line blocked. The bridge rested on a series of huge iron pillars, which appear to have snapped at the foundations. No one was injured, but traffic was delayed in consequence of the breaking of signal-posts and signals.

LONDON AND SOUTH WESTERN.

Mr. Owen's efficient management continues to attract traffic to the competitive portions of the London and South Western Railway, so that the widening of the main line between Basingstoke and Winchester is being pushed rapidly forward. This is the second section of the widening between Woking and Basingstoke. It is proposed to lay down two more lines of way, and remodel and extend the stations. The first section as between Sturt Lane and Farnborough is practically finished.

The fourth annual dinner of the goods staff of the London and South Western Railway was held at the King's Hall, Holborn Restaurant, on Saturday, January 14th, under the presidency of Mr. Alfred Malby, Goods Manager, who was supported by Lieut.-Col. the Hon. H. W. Campbell, Deputy Chairman of the Company; Mr. A. F. Govett, Director of the Company; Mr. Charles J. Owens, General Manager; Mr. John Dixon, Marine Superintendent; and Mr. W. B. Terrell, Nine Elms Superintendent; Mr. J. E. Hawkins, City Superintendent, being vice-chairman. The company numbered about 350, and a very enjoyable evening was spent.

The tram-car system of paying for journeys has been extended to the trains of the Waterloo and City Railway. The fares and tickets are now collected on the trains. Passengers would greatly assist by having the exact amount of the fare or their tickets ready.

They are also asked to see that a ticket is punched in their presence and handed them in exchange for each fare paid.

Mr. Wyndham Spencer Portal, whose services as Chairman the London and South Western Railway Company are about to lose, was born in July, 1822, so that he has reached the ripe old age of 76½. He became a director of the South Western in 1861, his connection with the Company having lasted thirty-eight years. Mr. Portal's name figures as director of the Somerset and Dorset Railway and as Chairman of the recently-opened Waterloo and City line.

Early on Saturday morning, January 21st, an accident occurred on the new Meon Valley Railway, at Privett, resulting in the entombment of two men working for Messrs. Relf and Sons, contractors. They were engaged in a shaft hole for a tunnel, 40ft. deep and 12ft. square, when, without any warning, the sides fell in. Large gangs were set to work to dig out the men. One was reached on Monday morning. He stated that his fellow worker, who was also entombed, died on Saturday. At the time of the collapse the former fortunately escaped injury from the falls of earth. On Saturday he heard the men above working to rescue him, and succeeded in climbing up the cross-pieces of timber to a height of 20ft. When the rescuers reached the man he was uninjured, though suffering much from exhaustion after his fifty-three hours' imprisonment.

MIDLAND.

The Midland Railway has ordered twenty locomotives from two American firms, ten from each. These engines are of the Mogul type, with cylinders 18in. diameter by 24in. stroke, the driving wheels are 5ft. 2in. diameter, and the weight of the machines, in working order, about forty-one tons. As might be expected, the United States engineering journals are jubilant at this capture of British trade. The facts revive memories of the Birmingham and Gloucester Railway experiment of sixty years ago, but probably the results will not be parallel.

The new Shirebrook curve connecting the Midland Railway with the Lancashire, Derbyshire, and East Coast Railway will be opened for traffic on Monday, March 20th. Commencing on that date, through Midland passenger trains will be run between Mansfield and Edwinstowe, which will place the towns of Nottingham, Derby, Birmingham, Burton,

Leicester, etc., in direct communication with Edwinstowe, and will afford additional facilities for visitors to the Sherwood Forest and the "Dukeries" district.

NORTH EASTERN.

Second-class carriages are to be abolished on and after March 31st on the Newcastle, North and South Shields, and Sunderland branches of the North Eastern Railway, the only lines of the Company on which second class is still retained. This decision is unfortunate, seeing that some lines by liberal treatment have greatly increased the number of second-class passengers. Colliers, dock labourers, and similar workmen will not be considered as the most desirable fellow-passengers by the erstwhile second-class passengers, who will now be compelled to travel third.

The North Eastern Railway is trying a system for providing a means for passengers to stop the trains in cases of emergency by releasing the air from the Westinghouse brake pipes, at the same time causing a whistle under the carriage to blow until the guard, by means of a key, restores the handle of the lever to its normal position. The guard is in this way able to locate the compartment in which the passenger who has made use of the apparatus is travelling. A special train fitted with the apparatus in connection with the Westinghouse brake was run from York to Scarborough and back on January 19th, and the result was very successful. Eleven stops were made by means of the appliance, and the train, which was travelling at speeds varying from 35 to 50 miles an hour, was stopped each time within a distance varying from 200 to 400 yards.

NORTH STAFFORDSHIRE.

Mr. Phillips, the General Manager, is always ready to adopt measures that tend to the success of the railway over which he so efficiently presides. In connection with the extension of the North Staffordshire Railway from Leek to Waterhouses (now under construction), arrangements are already concluded for working the Leek and Manifold Valley (narrow gauge) Light Railway. The North Staffordshire Railway Company will undertake to work and maintain in perpetuity the line, receiving 55 per cent. of the gross returns of the railway. The light railway will therefore receive annually 45 per cent. of the gross takings of the railway, free from any charges or expenses whatsoever, and that sum will,

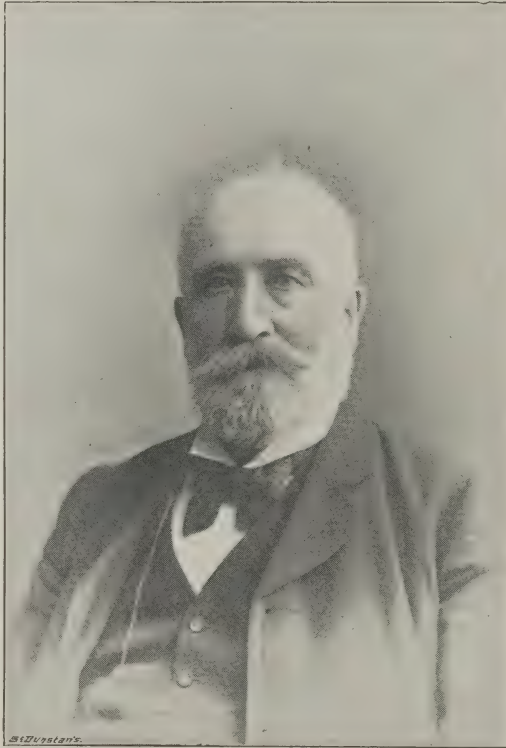
after providing for the annual payments to the County Council, be available for distribution to shareholders.

SOUTH EASTERN AND CHATHAM AND DOVER.

The joint working of these two railways is now in operation, and Mr. A. Willis, the General Manager, together with Mr. William Forbes, the Chief Assistant, are doing their best to efficiently serve the public, and at the same time to effect economies in the services. The printing of the whole of the time-bill, time-tables, and other notices at the works of the Chatham Railway, at Victoria, will be another step in this direction when the present contract expires. In the "Illustrated Interview" with Mr. John Morgan, of the London, Chatham and Dover Railway, that appeared in our issue of June last, it was stated that it was distinctly to the Company's advantage that the department should be maintained. It was proved that no branch of the labour could be done at a less cost outside.

The rough weather of the past month has provided opportunities for the whole of the Continental traffic being worked from Folkestone. At first the London, Chatham and Dover trains ran to Dover, and thence over the South Eastern Railway back to Folkestone; but later they were run via London, Chatham and Dover to Ashford, and thence direct to Folkestone over the South Eastern main line. Already the London, Chatham and Dover stations at Sevenoaks and Ashford are closed, and we suggest that whilst a new joint station is being built at Dover the present South Eastern Town Station be closed and the trains of both companies run to and from the London, Chatham and Dover Harbour Station.

When the new services are further consolidated we shall probably find the trains accelerated, and *really* express trains run over the South Eastern system. The "Great Southern" is apparently not big enough to manage its own refreshment department, as a contract has been entered into between the South Eastern Railway and Messrs. Spiers and Pond, by which this well-known firm of caterers will supply the refreshments at all the stations on the line, including, of course, London Bridge, Hastings, Dover, Folkestone, Margate, Canterbury, etc. In this connection, special attention will be paid to the luncheon and tea baskets; also to the daily supply of fresh bread and pastry, which will be sent down the line by the newspaper trains.



Robert A. Dykes
H.

THE RAILWAY MAGAZINE

MARCH, 1899

ILLUSTRATED INTERVIEWS

No. 21—MR. ROBERT ARMSTRONG DYKES

Traffic Manager, Somerset and Dorset Railway



IN having an illustrated interview with a manager of a joint railway, Mr. Dykes, one is obtaining a new experience in railway politics. Perhaps, as a preliminary, you will explain how dual ownership affects the working of a railway, and whether in traffic arrangements the owning companies are treated as 'foreign' lines or not?"

"The Somerset and Dorset joint line, to all intent and purpose, is a separate railway; each of the owning companies state their requirements, and it is for us to fit them in one with the other. Speaking generally, both companies are treated as 'foreign' lines, although each has power to make through rates from stations on their own systems to stations on the Somerset and Dorset. The line is managed by a directorate of three members from the board of each of the owning companies—viz., the Midland and the London and South Western. There is also a committee of joint officers of the parent companies, who meet periodically and discuss details, the line being worked generally to the best interest as a separate undertaking. Mr. George H. Turner (Derby) and Mr. Chas. J. Owens (Waterloo) are the joint General Managers; Mr. S. W. Johnson (Derby) is Chief Locomotive Superintendent, and Mr. E. Andrews (Waterloo) Chief Engineer."

"Your explanation having cleared the ground, I think we can now proceed to discuss the historical side of the Somerset and Dorset Joint Railway. The line is an amalgamation of the Somerset Central and the Dorset Central? The former of these was, I believe, a broad and the latter a narrow gauge line? Some account of these two undertakings would be of interest."

"Yes; the line is an amalgamation of the Somerset Central and the Dorset Central. The Somerset Central was originally a broad-gauge line, and extended from Burnham to Glastonbury and Wells. Powers were subsequently obtained for its extension to Cole, and this was carried out and opened in 1861, the whole of the line, with the extension, being then made a mixed gauge. In November, 1860, the first portion of the Dorset Central Railway from Wimborne to Blandford was opened and worked as a branch line by the London and South Western Company from their Wimborne Station. The Dorset Central Railway was subsequently extended to Cole, where it joined the Somerset Central, and the two lines were amalgamated in 1862 and afterwards worked as a narrow-gauge railway. Previous to this amalgamation the Bristol and Exeter worked the Somerset Central with their broad-gauge stock for seven years, and just prior to the termination of the agreement the Somerset Central began to arrange for working the railway themselves as a narrow-gauge line by building

B

locomotive shops at Highbridge, and providing rolling stock in contemplation of the amalgamation with the Dorset Central Railway."

"I learn that the first portion of the Dorset Central—from Wimborne (London and South Western Railway) to Blandford—was opened November 1st, 1860. The common idea of the Dorset Central Railway and the Somerset Central Railway was, I presume, to provide



MR. A. COLSON

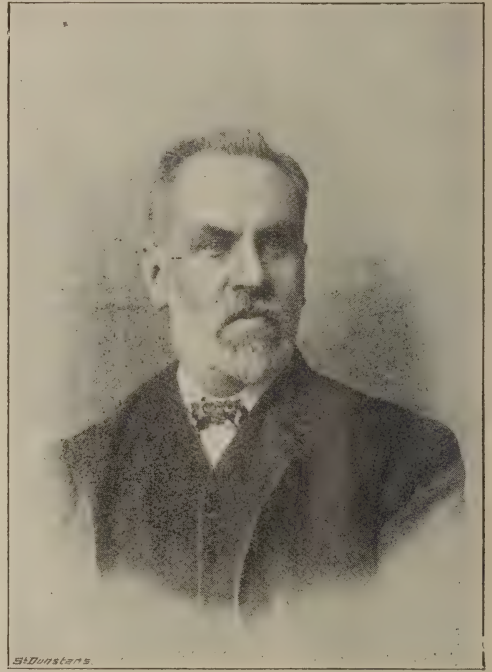
Resident Engineer, Somerset and Dorset Joint Railway

direct railway communication between the English and Bristol Channels?"

"Yes, that undoubtedly was their aim; but, as you are, of course, aware, there was nothing new about the idea of a railway from the Bristol to the English Channel, as during the railway mania of 1845 somewhat similar railways, with such high-sounding titles as Bristol and English Channels Connection; Bristol and English Channels Direct Junction; Exeter, Yeovil and Dorchester; Lyme Regis and Taunton; Wilts, Somerset and Southampton Junction; and other similar projects were suggested."

"From the very first, I believe, the London and South Western Railway had a considerable interest in the Dorset Central Railway?"

"Yes, that was so. They originally worked the line to Blandford, and after the amalgamation of the Somerset Central with the Dorset Central and their own acquisition of the Salisbury and Yeovil Railway, junctions were made at Templecombe. The Somerset and Dorset line became then a connecting link between



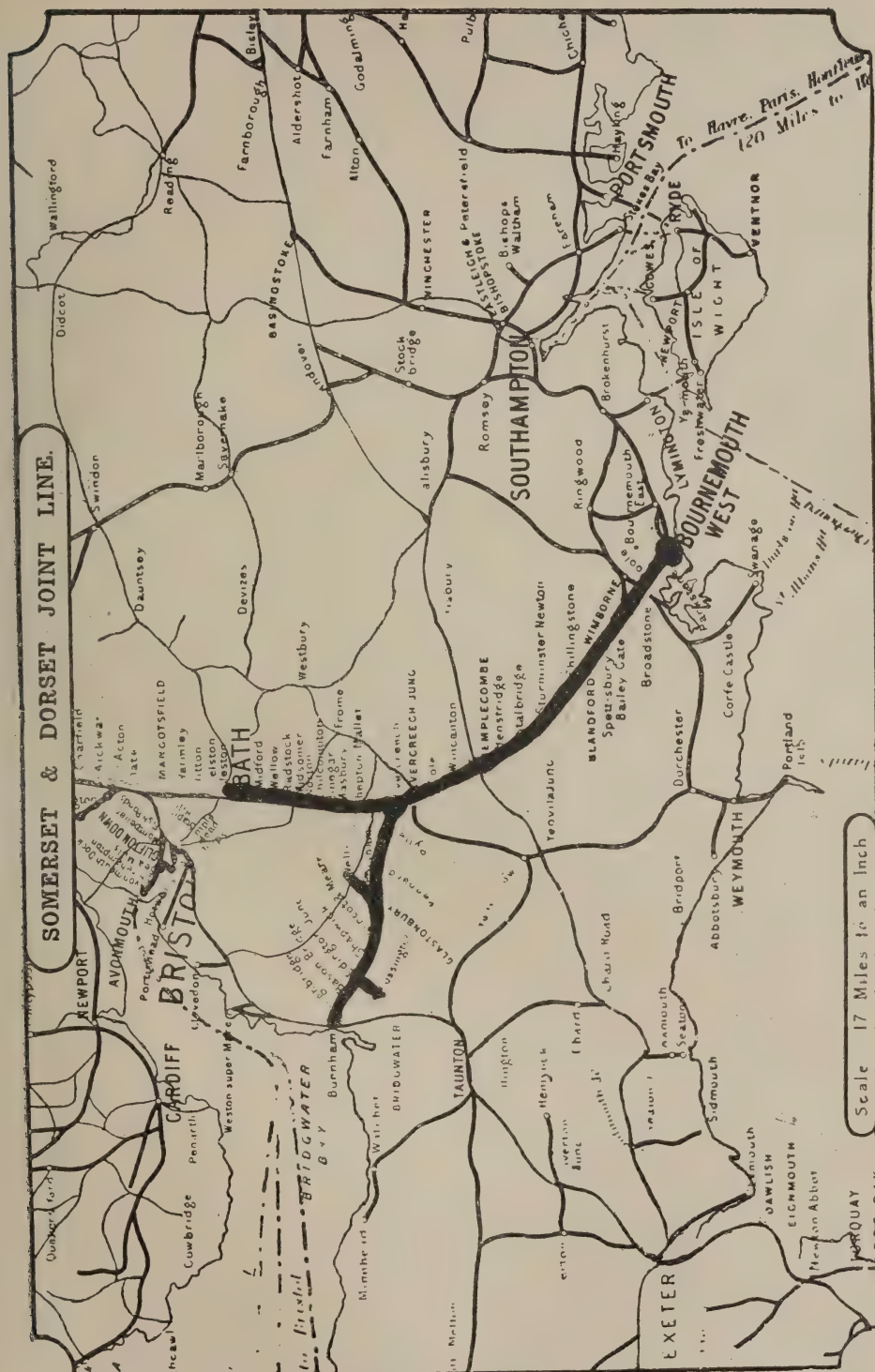
MR. A. WHITAKER, M.I.M.E.

Locomotive Superintendent, Somerset and Dorset Joint Railway

the London and South Western line to Exeter and that Company's line to Weymouth."

"The two railways were amalgamated on September 1st, 1862, as the Somerset and Dorset Railway. Will you, Mr. Dykes, give me some particulars of the fortunes of the railway as an independent concern prior to the London and South Western and Midland acquiring the undertaking?"

"The fortune of the old Somerset and Dorset was certainly very varied, and not particularly prosperous. Various schemes were contemplated whereby to retrieve their falling



fortunes. One project that was tried was the running of a line of steamers from Burnham to Cardiff; but, owing to this being a tidal service, the facilities offered were not so great as they otherwise would have been, and, after a trial of some years, they were finally withdrawn in 1871. One of the earliest of these boats, the 'Ruby,' had a remarkable career. When lying at Burnham she ran aground, and the receding tide left her perched upon the bank, causing her to break her back. Water-

"I judge, from its geographical position, it was subjected to considerable attentions from its broad-gauge neighbours on the one side and its narrow-gauge friends on the other?"

"Yes; considerable attention was paid us by the two companies, and agreements were entered into with the Bristol and Exeter on one side and the South Western on the other as regards through traffic."

"Can you tell me what course of events led up to the construction of the line from Ever-



OPENING OF THE CENTRAL SOMERSET RAILWAY, AUGUST, 1854

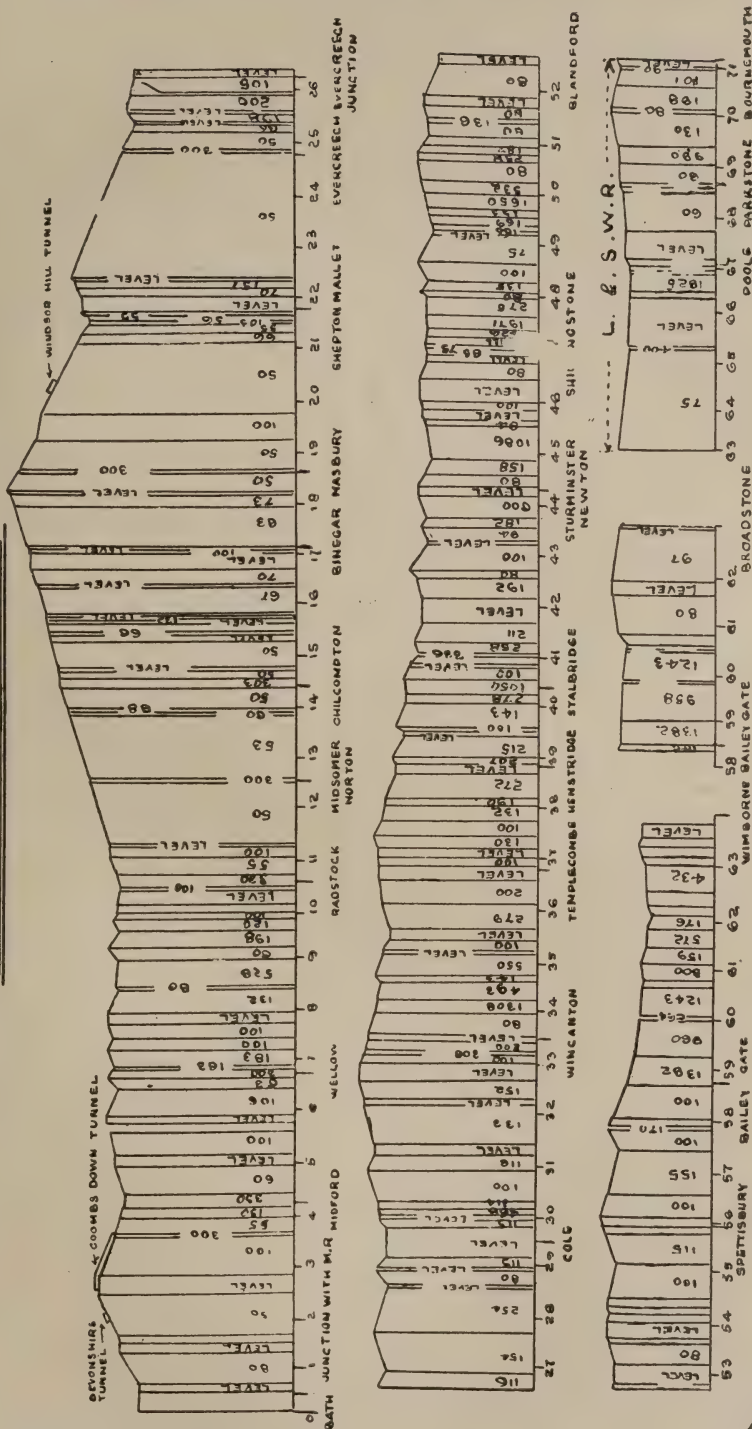
The Procession in the Abbey Grounds, Glastonbury

tight partitions were fitted, and the two ends were towed to Bristol and there put together again. Although only a small boat she was very fast, and when the American War broke out in 1862 she crossed the Atlantic and became a blockade-runner. There were also schemes put forward for extensions to Bristol, Bridgwater, and other places; but difficulties arose in each case, and it was not until the projected extension from Evercreech to Bath to join the Midland Railway was put forward that the old Company found themselves able to improve their position."

creech to Bath, thus forming a direct communication between the London and South Western and Midland Railways?"

"For some years there had been a desire on the part of the old Somerset and Dorset to improve their position, and it was therefore decided to extend their line to Bath, and so make their line an intermediate one between two powerful companies, and to make a connection between the North and South of England. They obtained Parliamentary powers, and the line was eventually opened for traffic on July 20th, 1874."

— S. & D. J. R. —
 — SECTION OF LINE, BATH TO WIMBORNE & BOURNEMOUTH. —
 — HORIZONTAL SCALE 4 MILES TO 1 INCH. —



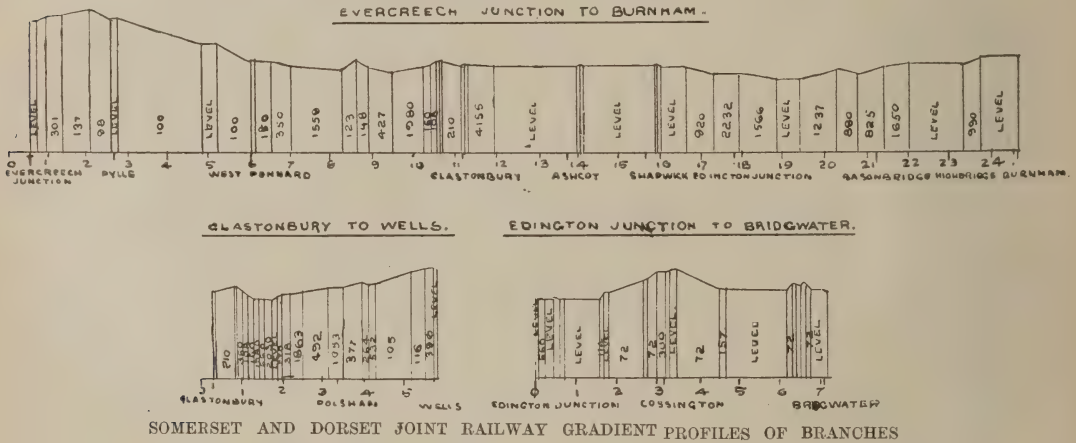
"After this connection was completed, I suppose the idea of the joint acquisition of the line by the London and South Western and Midland Railways took definite shape?"

"Yes; soon after the opening of the extension of the line from Evercreech to Bath, negotiations commenced for the acquisition of the line by the Midland and London and South Western Companies."

"Was there not a chance of the Bristol and Exeter Railway securing the Somerset and Dorset Railway before the present owners acquired it?"

"Yes; it was in 1875 the London and South Western and Midland Railways entered into an arrangement to jointly lease the Somerset

and Midland Railways were alive to the future advantage to be derived from the lines of the local company, and before the Great Western or the Bristol and Exeter had time to make any further proposal an arrangement had been concluded between the Somerset and Dorset Railway and the Midland and South Western Railways, whereby the two latter agreed to lease the former for 999 years. This lease was confirmed by an Act obtained in 1876. Unfortunately, the first year's working of the Somerset and Dorset Railway by the joint lines resulted in a considerable loss; while on August Bank Holiday, 1876, an accident happened on the line, killing thirteen passengers and the guard, and injuring many



and Dorset Railway as from November 1st, 1875. It was then a single line about 92 miles in extent, and the Somerset and Dorset Railway Company were in such a precarious financial position in 1875 that they asked the Bristol and Exeter Railway Company to lease them. This the broad gauge did not appear inclined to do, except upon terms that the Somerset and Dorset Railway Company considered insufficiently remunerative. The Great Western were also to some extent in treaty for the Somerset and Dorset, and this fact no doubt was the principal reason for prompt action on the part of the Midland and South Western. The narrow-gauge interests represented by the London and South Western

more of the occupants of the crowded carriages."

"The broad gauge portion of the railway fell into disuse immediately after the amalgamation, I believe? About what date was the last portion of the broad gauge line taken out?"

"The last portion of the broad gauge was taken out about 1870."

"Has the Great Western any rights over part of the system?"

"The Great Western have the right to run their trains through Wells Yard only, a distance of about nine chains."

"An account of the progress of the Somerset and Dorset under joint proprietorship will be of interest, Mr. Dykes."



ONE OF THE ORIGINAL NARROW-GAUGE ENGINES OF THE DORSET CENTRAL RAILWAY.

Built by G. England and Co., London (see page 201)

"As might naturally be expected, the line has continued to improve from the time the present owning companies acquired the lease. The traffic has gradually increased, until at the present time it has practically doubled itself, both in train mileage, tonnage, and number of passengers. Each of the owning companies interests itself in putting all the traffic it can over the line, and fosters through traffic in every possible way."

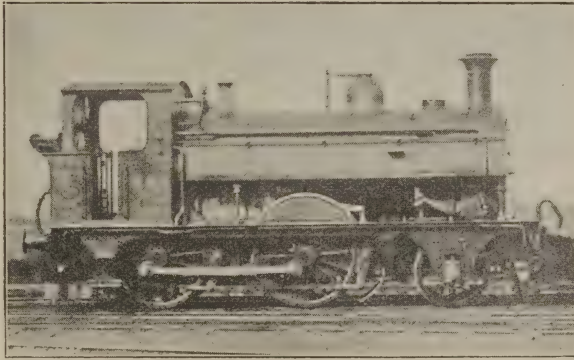
"Will you let me have some details of any special descriptions of traffic you deal with—both local and through?"

"Bournemouth (to which station, before the Somerset and Dorset became a joint railway, it enjoyed running powers, and to which place the joint trains run) stands out distinctly as being the most attractive resort for passenger traffic. A regular service is maintained, and through carriages run to and fro between York, Bradford, Sheffield, Derby, and Birmingham. There are fast expresses in each direction daily throughout the year. In the

that passing between the North and South-West; over 1,000 trucks have been exchanged

in one single day. In addition to this through traffic there are local collieries at Radstock, the limestone quarries in the Mendip Hills, and the rather uncommon Fullers-earth works at Midford and Wellow, each affording considerable traffic. Bricks from Burnham

and Bridgwater districts, and beer from Shepton Mallet and Binegar each form remunerative items of traffic; but of local production the



4-COUPLED SADDLE-TANK ENGINE, "NO. 28A"
SOMERSET AND DORSET JOINT RAILWAY
(see page 201)



6-WHEELS-COUPLED SADDLE-TANK BANKING ENGINE, SOMERSET AND DORSET JOINT RAILWAY.
(see page 201)

dairy produce is far and away the most important; no less than 28,000 churns of milk have been despatched—chiefly to London and the South-Eastern parts of England—in one month; while from the Glastonbury district comes the famous Cheddar cheese.”

“Then as to your locomotives and rolling stock; are these still built by you at Highbridge?”

“The works at Highbridge are now thoroughly up to date. They comprise locomotive erecting shop and repairs shops, carriage and wagon building shops, general stores, etc. The whole of the repairs, rebuilding, etc., are now carried out at Highbridge. In the erecting shop is a novel machine, designed by Mr. Whitaker, for transferring an engine from the centre line to either of the side pits, or *vice versa*, thus avoiding the necessity of having more than one overhead crane (see illustration, page 205). The method adopted is as follows:—The leading end of the engine is first lifted by means of the overhead crane on to a small carriage

which runs on rails placed upon the top of two inclined girders braced together. The movement of the carriage is controlled by means of an endless chain running over a brake-wheel. The trailing end of the engine is suspended from the crane-chains, and is conveyed across by the direct action of the overhead crab, the brake of the small traverser being at the same time released so as to allow it to run from the higher to the lower end of the inclined girders.

“The engines that are now running were specially designed for the line, which, in passing over the Mendip Hills, has a ruling gradient of 1 in 50. The main-line passenger engines were built from the designs of Mr. Johnson, of the Midland Railway. They have four-coupled wheels 5ft. 9in. in diameter, leading bogie, with 18in. by 24in. cylinders. With a load of eleven six-wheelers they do excellent work, considering the gradients—the run between Bath and



A PEEP AT THE PYLLE BANK OF 1 IN 100 FOR TWO MILES.
Somerset and Dorset Joint Railway.

Bournemouth, 71 miles, occupying 2hr. 10min., with seven intermediate stops, four of these being local stations on the London and South Western Railway. The goods engines are practically of the Midland standard type. The bank engines are very powerful. The engines and stock are all fitted with the patent automatic vacuum brake, the standard colour of our locomotives being blue. The following table gives particulars of our various locomotives:—

PARTICULARS.	Standard Express Passenger Engine, No. 14.	Standard Bogie Passenger Tank Engine, No. 13.	Old Saddle Tank Passenger Engine, No. 28a.	Standard 6-Wheel Coupled Goods Engine, No. 66.	Line Banking Engine, No. 1.	Old Dorset Cent Railway Engine, 10a.	Colliery Engine, No. 45a.
Diameter of Cylinders ..	18 in.	17 in.	16 in.	18 in.	17 in.	11 in.	10 in.
Stroke ..	24 in.	24 in.	18 in.	26 in.	24 in.	14 in.	14 in.
Working Pressure ..	150 lbs.	140 lbs.	115 lbs.	150 lbs.	140 lbs.	115 lbs.	150 lbs.
Tractive Power ..	12396 lbs.	11049 lbs.	7680 lbs.	14826 lbs.	14450 lbs.		4277 lbs.
Adhesive Power ..	11784 lbs.	12678 lbs.	12009 lbs.	17264 lbs.	18450 lbs.		8718 lbs.
Description of Brake ..	Steam contld. by Auto. Vac.	Steam, contld. by Auto. Vac.	Steam, contld. by Auto. Vac.	Steam, contld. by Auto. Vac.	Steam.		Steam.
Grate Surface ..	16 sq. ft.	14½ sq. ft.	13 sq. ft.	17½ sq. ft.	14½ sq. ft.	14 sq. ft.	5 sq. ft.
Heating Surface:—							
Firebox ..	104 sq. ft.	100 sq. ft.	80 sq. ft.	110 sq. ft.	94 sq. ft.	68 sq. ft.	37 sq. ft.
Number of Tubes ..	246 } 1095	246 } 1151	170 } 721	244 } 1141	213 } 1053	178 } 781	69 } 273
Diameter of Tubes ..	1½ in. } sq. ft.	15 in. } sq. ft.	1½ in. } sq. ft.	1½ in. } sq. ft.	1½ in. } sq. ft.	1½ in. } sq. ft.	1½ in. } sq. ft.
Total Heating Surface ..	1202 sq. ft.	1251 sq. ft.	801 sq. ft.	1251 sq. ft.	1147 sq. ft.	849 sq. ft.	310 sq. ft.
Weight Empty—Engine ..	36 13 3	37 4 1	31 16 3	34 13 1	34 14 1		16 7 3
Tender ..	17 11 1			19 5 3			
Total ..	54 5 0			53 19 0			
Weight in Working Order—							
Engine ..	39 0 2	43 10 1	37 8 0	38 10 3	41 0 2	..	19 7 2
Tender ..	29 17 3			32 14 3			
Total ..	68 8 1			71 5 2			
Capacity of Tank ..	2200 Galls.	876 Galls.	944 Galls.	2950 Galls.	1200 Galls.		501 Galls.

*See illustration below.

†Illustrated on page 139.

"Have you any extensions in contemplation?"

"No; the line is already doubled to Templecombe, and south of that point land is being bought and the work is being pushed on, so that eventually the main line will be doubled. The whole of the line is worked on the absolute block principle, and the single line by the tablet system, so that you will see strict attention is paid to the safety of all concerned."

"I notice, in 1891, some rearrangement of the capital was sanctioned, the original shareholders receiving Midland debentures in exchange. Is the 999 years' lease still running,

or has the Somerset and Dorset Railway been purchased outright by the London and South Western and Midland Railways?"

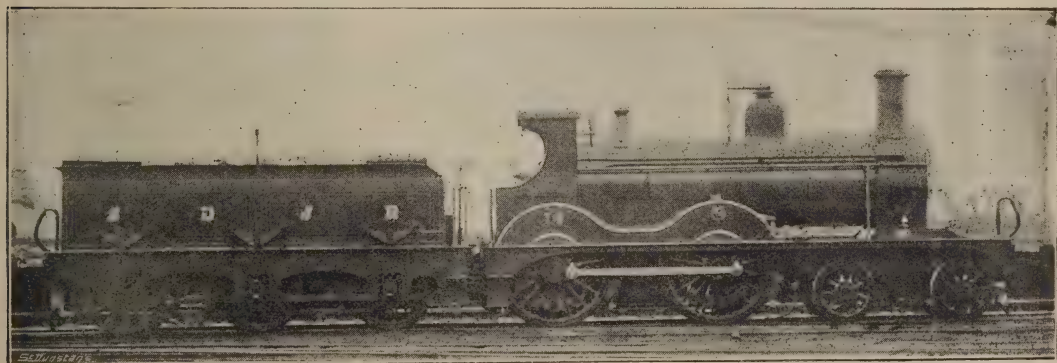
"The exchange of stock was quite optional. A considerable number of the original shareholders accepted the offer. The lease is still running."

"Now, Mr. Dykes, if I have missed any points on which you would like RAILWAY MAGAZINE readers to be informed, kindly let me know."

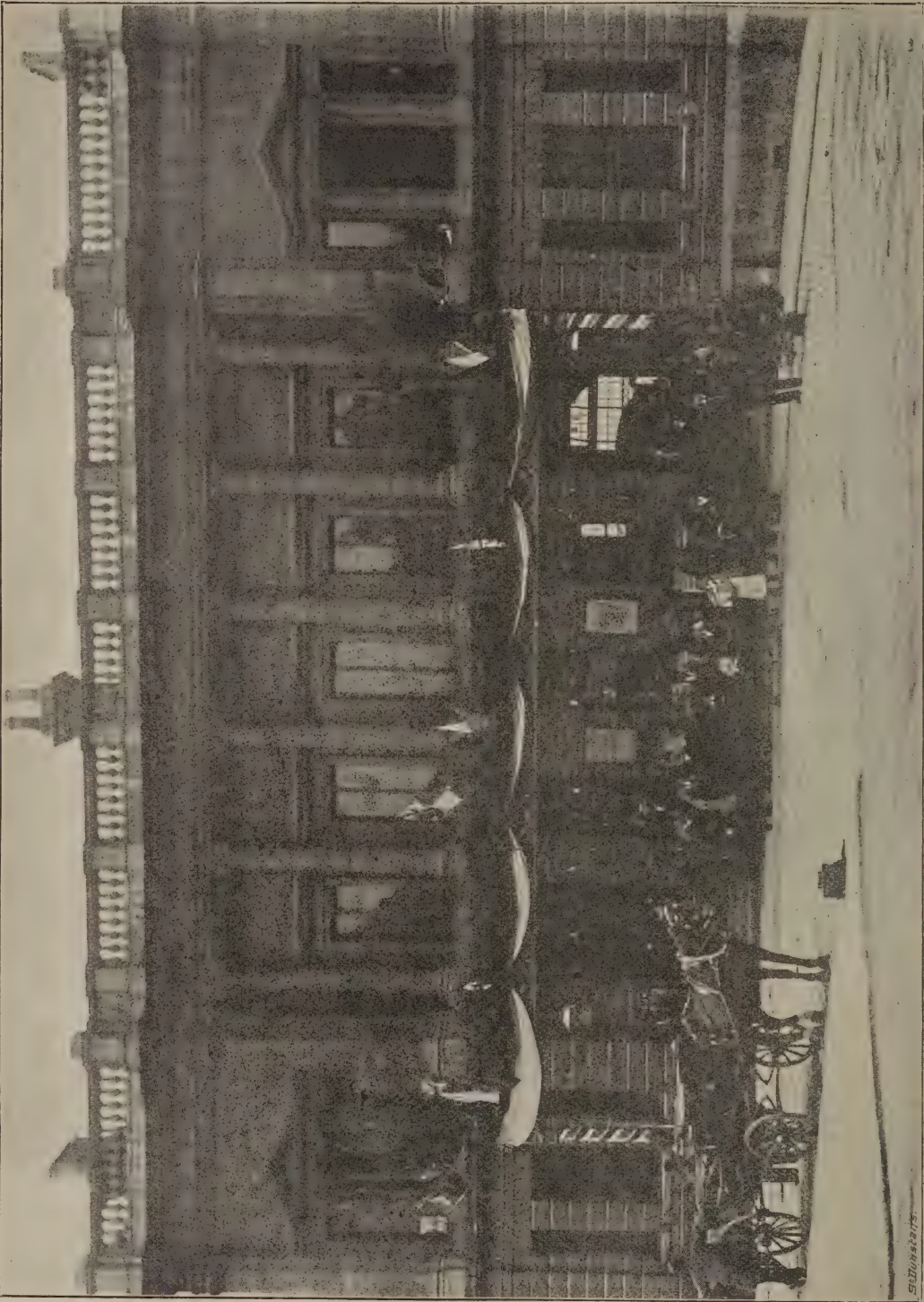
"No, I think not."

"As to your own career, Mr. Dykes?"

"I am the grandson of Mr. John Armstrong, a member of the old Institute of Civil Engi-



LATEST TYPE OF EXPRESS PASSENGER ENGINE, SOMERSET AND DORSET JOINT RAILWAY.
(see table above for dimensions)



[Lewis, Bath

EXTERIOR OF BATH STATION, SOMERSET AND DORSET JOINT RAILWAY

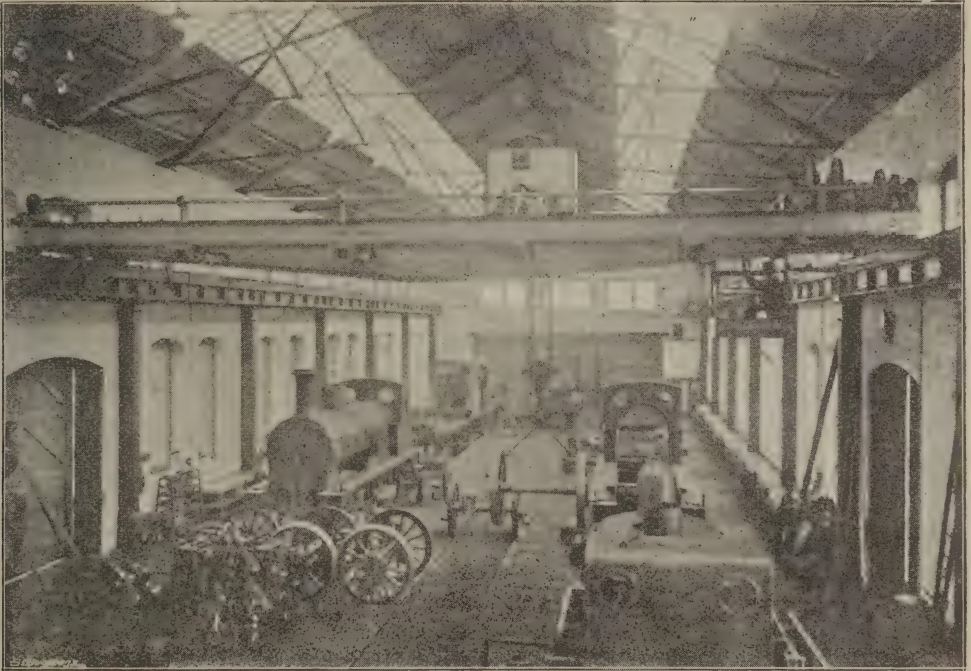
Sturges

Photo by I

neers, who was connected with the making of St. Catherine's Dock, the Thames Tunnel, and the Menai Bridge, and was finally appointed Civil Engineer for the City of Bristol. My father was for many years with the old Bristol and Gloucester Railway, and subsequently the Midland, which he left in 1855 to become Chief Superintendent of the Bristol and Exeter Railway. I commenced my railway career in 1849, joining the Midland Railway at Bristol as a lad-clerk; was afterwards attached to the outdoor staff of the Superintendent of the Line at Derby, and in 1865 took charge of the

"Thank you, Mr. Dykes; and who are your chief assistants?"

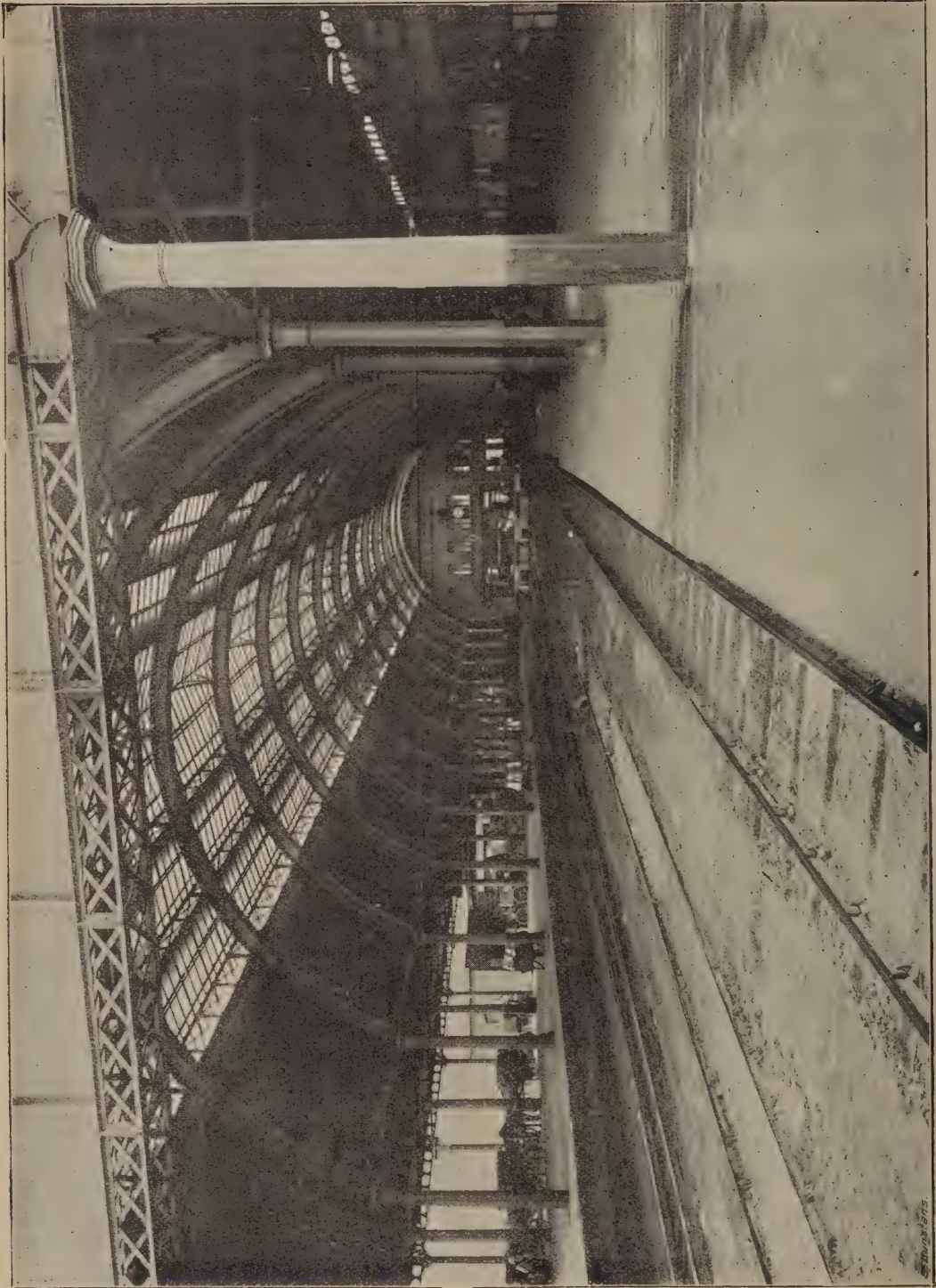
"Mr. Alfred Whitaker, M.I.M.E., the Resident Locomotive, Carriage and Wagon Superintendent, was a pupil of the late Mr. Matthew Kirtley, Locomotive Superintendent of the Midland Railway from 1844 until his death in 1873. After having charge at various locomotive depôts in the northern division, including Carlisle and Leeds, Mr. Whitaker was transferred from the latter station to the service of the Somerset Joint Committee in November, 1889.



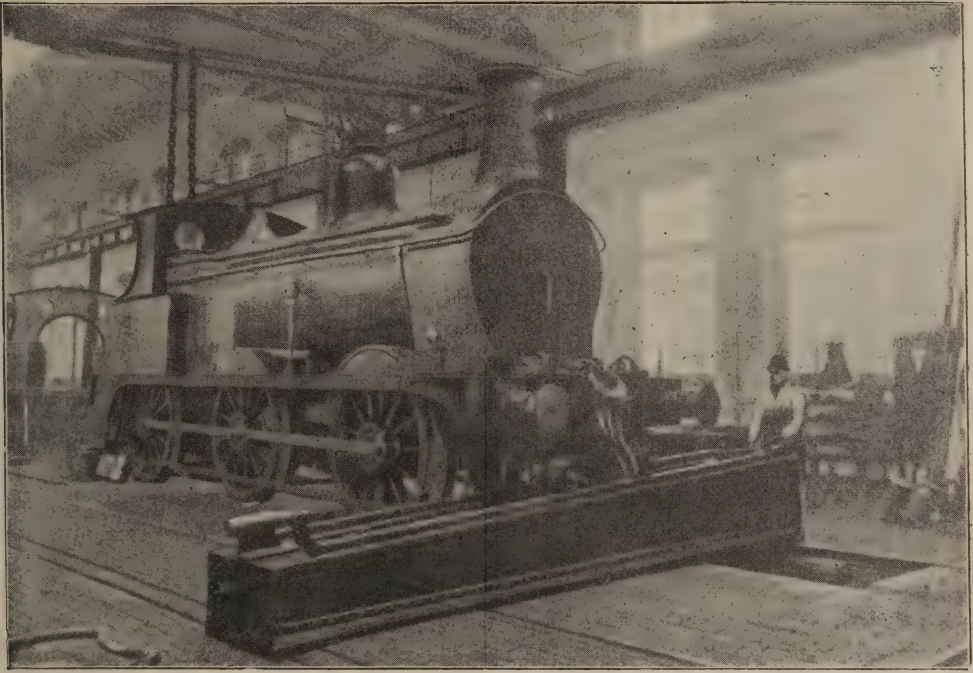
INTERIOR OF ERECTING SHOP, HIGHBRIDGE WORKS
SOMERSET AND DORSET JOINT RAILWAY

Bourne and Lynn joint line, in Lincolnshire, the property of the Midland and Great Northern Railways. In 1876 I was appointed to my present position. You will quite understand that for some years I found I had a very uphill task before me, but by dint of unceasing labour on the part of Mr. Whitaker, Mr. Colson, and myself, well backed by the owning companies, we have succeeded in placing our line on a par with any in the kingdom."

"Mr. Alfred Colson is a son of Thomas Colson, who was Engineer of the Croydon Canal for twenty-seven years. Mr. Colson himself commenced his career with his brothers, who were railway contractors. He was engaged in the construction of the Somerset Central Railway, and, after its completion, joined the Engineer's staff of the Somerset Central Railway, and continued in their service until the leasing of the line to the present owners,



INTERIOR OF BATH TERMINUS, SOMERSET AND DORSET JOINT RAILWAY



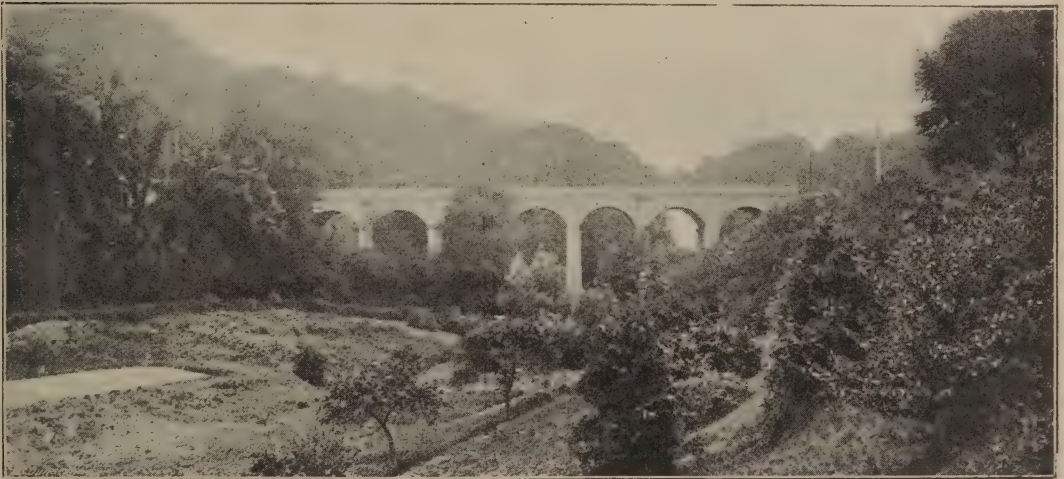
MR. WHITAKER'S ENGINE TRANSVERSER IN USE IN THE HIGHBRIDGE LOCOMOTIVE WORKS.
SOMERSET AND DORSET JOINT RAILWAY

whereupon Mr. Colson was appointed Resident Engineer for the joint system.

"Mr. H. Leaker, the Accountant, has also grown up with the line, and, step by step, has worked his way up to his present position."

"Before closing this pleasant conversation,

I must offer you my hearty thanks for the great trouble you have taken to give me every information I desire. I am sure the RAILWAY MAGAZINE's first interview with a manager of a joint railway will be greatly appreciated by my readers. Good-bye!" G. A. SEKON.



MITFORD VIADUCT, NEAR BATH, SOMERSET AND DORSET JOINT RAILWAY

SOME WONDERFUL LITTLE ENGINES

BY CHARLES ROUS-MARTEN



TO avoid the risk of misconception at starting, I may as well say at once that the engines I am going to write about are those designed and built by Mr. Mr. F. W. Webb for the London and North Western Railway, having 6ft. 6in. coupled wheels and 17in. by 24in. cylinders, and being generally known either as "Precedents"—that being the name of the one first built—or "Jumbos"—for no clearly ascertainable or conjecturable reason at all.

Up to the year 1866 all, or nearly all, of the express work on the North Western Railway—as, indeed, on most other lines—was performed by single-wheel engines. Not to

up to 1885. Both of these types were admirably designed for the work they were originally required to do, and many brilliant feats are on record to their credit. But just as even at the present day certain classes of express traffic have outgrown the capabilities of very fine single-driver locomotives and compelled recourse to coupling as affording larger adhesion weight, so as long ago as 1866 some of the London and North Western express work had become too much for the "Problems" and "Bloomers."

Mr. John Ramsbottom, then Chief Mechanical Engineer at Crewe, set himself to provide the requisite increase of power. The feasibility of employing coupled engines for express work had already been demonstrated by Sir Daniel (then Mr.) Gooch on the Great Western in

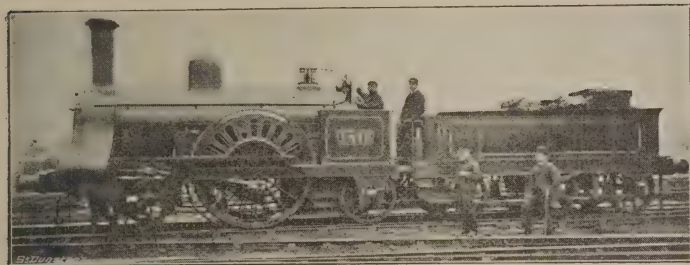


TREVITHICK'S 6FT. SINGLE, "VESTA"

mention a variety of types introduced in the early days of Messrs. Trevithick, Allen, Bury, Crampton, and others, the "Problems" of Mr. Ramsbottom, with 7ft. 6in. wheels and 16in. by 24in. cylinders, and the "Bloomers" of Mr. McConnell continued to run express trains, the former up to the present day and the latter

1855, by Mr. J. Cudworth on the South Eastern in 1858, and by Mr. W. Kirtley on the Midland in 1862. And so Mr. Ramsbottom turned out at Crewe in May, 1866, "Newton," No. 1480, the first of his coupled express engines. The coupled wheels were 6ft. 6in. in diameter, and the cylinders (placed inside)

were 16in. by 24in. The new locomotive worked so well that no fewer than 96 in all were built—some, indeed, in 1873, after Mr. Webb had succeeded Mr. Ramsbottom in the Crewe chieftainship—and, proportionately to their power, they have always done excellent work. I believe that some of those latest built had their cylinder diameter enlarged to 17in.;



ALLEN'S 7FT. SINGLE "PEGASUS"

and during the last dozen years or so all have been rebuilt by Mr. Webb, with that cylinder diameter and larger boilers, and have, in fact, been converted into the "Precedent" class.

While it has been necessary, in elucidating the genesis of the "Precedent" engine, to refer to these forerunners of the type, I desire to give my absolute dissent from the view which I have heard expressed that the "Precedents" are merely a slight enlargement of the "Newtons," and that therefore to Mr. Ramsbottom, not Mr. Webb, belongs the credit of the later engines' excellence. That both have certain points in common is, of course, self-evident; but, if that alone be taken into account, then all modern engines are merely improvements of earlier types. The point here is that Mr. Webb's modifications of the original 6ft. 6in. coupled design were of sufficient importance to constitute the "Precedent" class a virtually new one, and to change what had been simply a good ordinary engine into one which has proved itself quite exceptional in its relative capacity. Anyone who has seen the "Newtons" in their original shape—not in their later forms as changed for the first and second time by Mr. Webb—will readily appreciate the accuracy of my view.

Again, I have travelled many times behind

the Ramsbottom engines before their rebuilding into "Precedents," and I have no record of such remarkable performances on their part as the Webb engines have given me in perfect "heaps," nor have I been able to glean any of an authentic character from other sources. They simply did the work ordinarily done by locomotives of the same dimensions, but no

more. It may be rejoined that the Ramsbottom engines had not the same opportunities of distinguishing themselves as the Webb engines always have had, and that therefore this comparison is unfair. That, no doubt, is true to some extent. But it is not the whole truth. I personally have had opportunities of comparing the work of both classes on similar trains, and

the superiority of the Webb engines was unquestionable. I say this in no disrespect to Mr. Ramsbottom, for whom I have always cherished the warmest admiration, and whose engines, when they are built, were unsurpassed anywhere. All I say is that Mr. Webb introduced a new type which was still better.

Nor were the "Newtons" the actual immediate precursors of the "Precedents." When Mr. Webb came to the conclusion that a new and stronger engine was needed, he first tried the experiment of obtaining this increased tractive power by reducing the diameter of the driving-wheels. I believe it is a fact, although I do not know it from himself, that he was impressed with the good work done in America with express engines having driving-wheels only 5ft. or 5ft. 6in. in diameter, and that, to test the suitability of small wheels to British express duty, he first tried a goods engine which had 5ft. 2in. drivers and cylinders 17in. by 24in., removing the side rods from the leading wheels, and so converting it into a 5ft. 2in. four-coupled engine; and I believe that this engine, when employed in running the best London and North Western expresses of that day, kept perfect time, but that the desideratum of that period—"fifteen coaches on the level at a mile a minute"—

could not be attained, because the small size of the wheels required the cylinders to be so frequently filled that the boiler could not supply sufficient steam. I do not vouch for all this, but "I tell the tale as it was told to me," and I have every reason to deem it accurate.

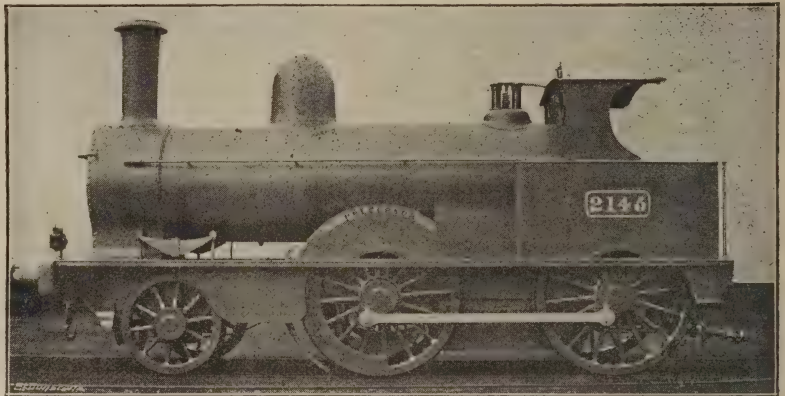
I have often regretted that the moral lesson deduced from this experiment was not—*bigger boiler*. If the boiler would not furnish enough steam with the small wheels which gave such enhanced power, there were two courses open—either the boiler or the wheels might be enlarged. It would have been interesting to see what results could have been attained on the Lancaster-Carlisle road with a large boiler and 5ft. 2in. wheels. Mr. Webb, however, thought it preferable to use a slightly larger wheel, and adopted the diameter of 5ft. 6in. He named the pioneer of this class "Precursor," and constructed altogether forty of that type. With cylinders 17in. by 24in., they possessed a tractive force of as much as 105lb. for every pound of effective steam pressure in the cylinders. That is to say, although they weighed only about 31 tons, they had the same nominal tractive force per pound of cylinder pressure as the large new Great Western engines, which weigh over 52 tons. And they did capital work, pulling up steep banks loads with which the "Newtons" had required pilot assistance, and running, under favourable conditions, quite as swiftly as the 6ft. 6in. class. I have myself timed one of these "Precursors"

at 74 miles an hour at a period when 75 was deemed the maximum possible in ordinary circumstances. In fact, when both the "Precursors" and their successors the "Precedents" were sharing the same work I found no difference in the speed of the two types. That is

to say, I found the "Precursors" run just as fast on the level and downhill as the 6ft. 6in. engines, while uphill they possessed a manifest advantage.

But soon after they had been placed on the road Mr. Webb decided that a larger wheel was desirable for the fastest express work, and so he took his "Precursor" type as a standard and simply gave it a 6ft. 6in. wheel, instead of 5ft. 6in., and a slightly enlarged fire-box, which made the total heating surface 1,083 square feet for the 6ft. 6in. engine, instead of 1,074 as in the 5ft. 6in. coupled type.

And so we got the "Precedent" or "Jumbo" class of express locomotive, which, in my experience, has done heavier work than any other engine, present or past, of similar small weight. I have no personal enthusiasm or even predilection for any particular engineer or designer or railway or type of locomotive. I simply judge the tree by its fruits, the engine by its work. I have styled these North Western locomotives of the "Precedent" class "wonderful little engines," and I have done so advisedly, in no spirit of partisan enthusiasm, but in calm review of their actual perform-

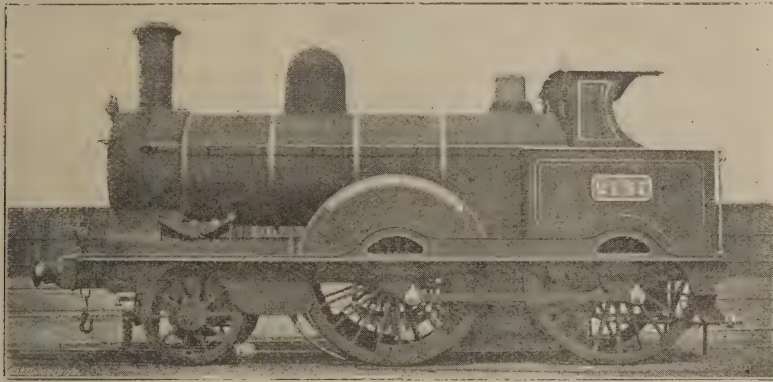


THE FIRST OF MR. WEBB'S PRECURSOR CLASS OF EXPRESS ENGINE.
Cylinders, 17 x 24; coupled wheels, 5ft. 6in. Now rebuilt as tank engine.

ances. When a cheaply-built little engine, weighing only 32½ tons, can and does perform satisfactorily the same work as is allotted on some other lines to large and costly locomotives, weighing from 47 to 52 tons, it is surely warrantable to attribute to the smaller engines

exceptional merit in respect of design and construction. I am open to correction, but so it seems to me. Later on I shall produce abundant proof that I have not over-rated either the capacity or the performances of these engines.

Seventy of the "Precedent" type were built between the years 1875 and 1882 inclusive. No more were constructed, the "compound"



"PENRITH BEACON," ONE OF MR. WEBB'S "PRECEDENT" CLASS
Cylinders, 17in. by 24in.; coupled wheels, 6ft. 6in. diameter

era then setting in. But in 1885 or 1886 Mr. Webb took in hand the rebuilding of the Ramsbottom or "Newton" class of 6ft. 6in. coupled, including those of that type which he himself had built on his first accession to the chief post at Crewe. All of them, 96 in all, have now been rebuilt, with larger and higher-pitched boilers and the other improvements characterising the "Precedent" order—have, in fact, been entirely transformed into brand-new "Precedents," thus bringing up the total numerical strength of that class to 166. All are now at work, and, as I shall show, are doing wonders, considering their small size and weight.

Next have to be recorded two other metamorphoses on a large scale. Soon after the first advent of the "Precedents," the "Precursors" were taken off the best express services, even on such lengths of line as that between Preston and Carlisle, the newer 6ft. 6in. coupled taking their place. They continued, however, to run some of the expresses which were timed less

fast, and did all sorts of duty on both the Carlisle and the Leeds sections, besides sometimes piloting the faster expresses. And they appeared to me always to do it very efficiently, for in my opinion they, too, were "wonderful little engines" in view of what they could do with their light weight of only $31\frac{1}{4}$ tons. It would have been most interesting to see what they could have done with larger boilers and

higher steam pressure. But apparently the 5ft. 6in. wheel was condemned as too small for express running, and so the fiat went forth that all forty of the "Precursor" engines were to be transmogrified into passenger "tanks." This was done by degrees as the "Precursors" came in for heavy repairs, and by the

time that twenty years had elapsed since their first appearance all had been thus altered, the tenders and name-plates being taken off, the frames lengthened, and a pair of radial trailing wheels added. They make excellent tank engines for suburban work, but their admirers—of whom I avow myself one—may be permitted to drop a silent tear of regret over their disappearance from the higher class of service.

And now came another curious transformation scene. We have just seen forty main-line express engines converted into suburban "tanks"; we have now to behold the conversion of ninety feeble little tender engines, originally built for the inferior classes of train service—now far better performed by tank engines—into a new and excellent race of main-line express locomotives, almost exactly resembling the "Precedents," save in having 6ft. coupled wheels, and so possessing 96lb. of tractive force for each pound of cylinder pressure, instead of 88lb. as in the case of the 6ft. 6in. engine.

How those scrubby little 6ft. coupled tender engines, as they formerly were, came originally to be built I have never been able to understand. When such a man as John Ramsbottom could build sixty of them, and such another as Mr. Webb some thirty more many years after the first came out, it must be presumed that they possessed, or appeared to possess, some capacity for usefulness. All the same, I frankly confess that I have never been able to detect it. To me they always seemed feeble and unsatisfactory. No one nowadays would dream of building a tiny 6ft. coupled engine, with Liliputian boiler and cylinders 16in. by 20in., to do the work to which those small machines were put. The prototype of the class which came out in 1863 was named, with obvious irony, "Samson." Similar irony seems to have been maintained in the description of the operation they have undergone as "rebuilding." So far as I can make out, all that remains of the original engine may be said to be the wheels and name-plates, not even the crank-axes, for the throw of the cranks has been lengthened from 10 to 12 inches, with a 24in. piston stroke instead of 20in., so evidently the later opinion at Crewe agrees with mine.

In plain terms they may now be designated as very efficient, though small, new engines, slightly heavier than the "Precedents" and a little more powerful through having coupled wheels 6in. smaller. But they seem able to do anything that the 6ft. 6in. engine can do, and with heavy loads or on steep banks a little more. Practically, they are interchangeable with the 6ft. 6in. class in any express work, and may be regarded as bringing up the total number of non-compound coupled express engines now running on the London and North Western line to 266. They are chiefly used on the Carlisle and Leeds portions of the North Western system, where the gradients are the most severe. They have thus replaced the "Precursors," and outnumber them by more than two to one.

Before I proceed to give instances of work done by the locomotives whose genesis and history I have been setting forth, it may per-

haps be interesting to many readers who have not the means of access to the official records if I furnish a complete list of the "Precedent" class. The following are the names of the seventy engines originally built by Mr. F. W. Webb of the "Precedent" type, together with the years in which they came out:—

1874—"Precedent"	1877—"Hercules"
1875—"Robert Benson"	"Princess Louise"
"Edward Tootal"	"Stewart"
"Pluck"	1878—"Chandos"
"Patience"	"Joshua Ratcliffe"
"Perseverance"	"Miranda"
"Buffalo"	"General"
"Giraffe"	"Auditor"
"Antelope"	"Plynlimmon"
"Reynard"	"Nasmyth"
"Alma"	"Mercury"
"Lowther"	"Marathon"
"Penrith Beacon"	"Rocket"
"Chillington"	1880—"Caractacus"
"Avon"	"Commodore"
"Princess Beatrice"	"Duchess of Lancaster"
"Snowdon"	"Pegasus"
"Caradoc"	"Sir Alexander Cockburn"
"Salopian"	"Lazonby"
"Cambrian"	"Lawrence"
1877—"Prince Leopold"	"Mabel"
"Sir Salar Jung"	"Breadalbane"
"Merrie Carlisle"	"Humphrey Davy"
"Amazon"	1882—"Charles Dickens"
"Balmoral"	"Henry Pease"
"Meteor"	"President Garfield"
"Pilot"	"President Lincoln"
"Envoy"	"President Washington"
"Courier"	"Duke of Albany"
"Disraeli"	"Duke of Connaught"
"Condor"	"Wheatstone"
"Llewellyn"	"Buckland"
"Fairbairn"	"Thomas Carlyle"
"Proserpine"	
"Wizard"	
"Phantom"	
"Sir Hardman Earle"	

The following is a list of the 6ft. 6in. coupled engines originally designed by Mr. John Ramsbottom or built to the same design by his successor, Mr. F. W. Webb, before the advent of the "Precursor" class, and subsequently rebuilt by Mr. Webb as practically new engines of the "Precedent" type:—

"Minotaur"	"Pitt"
"Penmaenmawr"	"Marlborough"
"Booth"	"Wolfe"
"Sedgwick"	"Abercrombie"
"Quernmore"	"Drake"
"Buckingham"	"Raleigh"
"Brougham"	"Frobisher"
"Eamont"	"Cook"
"Tennyson" (formerly Dunrobin)	"Columbus"

"Scotia"	"Hampden"
"Isabella"	"Ariadne"
"Clarendon"	"Corunna"
"Hardwicke"	"Dagmar"
"Blenkinsop"	"Ilion"
"Shah of Persia"	"Ganymede"
"Richard Cobden"	"Shamrock"
"Wordsworth"	"Talavera"
"North Western"	"Lucknow"
"S. R. Graves"	"Delhi"
"John Ramsbottom"	"Vimiera"
"Pioneer"	"Nile"
"Queen"	"Badajos"
"Prince Albert"	"Airey"
"Albion"	"Bunsen"
"Premier"	"Livingstone"
"Florence"	"Minerva"
"Phaeton"	"Novelty"
"Lightning"	"Sisyphus"
"Belted Will"	"Speke"
"Newton"	"Gladiator"
"Herschell"	"Magdala"
"Newcomen"	"John Bright"
"Telford"	"Bevere"
"Smeaton"	"John Mayall"
"Dalton"	(formerly "Tennyson")
"Faraday"	"Britannia"
"Murdock"	"Hibernia"
"Brindley"	"Henry Crossfield"
"Duke of Edinburgh"	"Madge"
"Shakespeare"	"Alecto"
"Scott"	"Witch"
"Milton"	"Lynx"
"Byron"	"Princess"
"Princess Helena"	"Patterdale"
"Countess"	"Vulcan"
"Duchess"	"Pluto"
"Franklin"	"Hector"
"Gladstone"	"Director"
"Cromwell"	

Their dates range from May, 1866, to 1873. They have inside cylinders, 17in. by 24in.; driving and trailing wheels coupled, 6ft. 6in. or 6ft. 7½in., with new tyres; 150lb. steam pressure; 1,083 square feet total heating surface—viz., tubes, 980 square feet, fire-box, 103. The following is the distribution of the weight in working order:—Leading-wheels, 10 tons 5 cwt.; driving-wheels, 11 tons 10 cwt.; trailing-wheels, 11 tons; total, 31 tons 15 cwt. The weight available for adhesion is 22½ tons. The tender, which has the scoop for picking up

water while running, weighs 25 tons. The boiler and wheels are of steel. The leading-wheels are 3ft. 9in. in diameter.

It will be noticed from these dimensions how well the weight is balanced through its very even distribution among the three pairs of wheels; while the illustration appended brings out into strong relief the remarkable neatness and compactness of the general design. It may be added that the "Precedent" engines are constructed at a cost which seems extraordinarily small when compared with that of many other engines possessing no greater efficiency.

In my next article I shall give a number of striking instances of the splendid work done by these "wonderful little engines" under my own observation. I may remark here in passing that one of this class won the average speed record in each of the great races from London to Scotland. In the race to Edinburgh in 1888, No. 275—"Vulcan"—ran from Crewe to Preston, 51 miles, in 50min., and then from Preston to Carlisle, 90 miles 10 chains, in 90min. The load was 76 tons. In the race to Aberdeen of 1895, No. 790—"Hardwicke"—with 70½ tons, ran from Crewe to Carlisle, 141¼ miles, in 126, 126½, or 127 minutes, according to the different timekeepers, thus



RAMSBOTTOM'S 6FT. 6IN. COUPLED ENGINE AS FIRST REBUILT BY MR. WEBB

averaging about 67 miles an hour, including the ascent of the Shap bank, 4½ miles of 1 in 75. The loads, of course, were very light, but the average start-to-stop speed remains quite without parallel in this country, with loads

however small, and was not equalled by any of the various classes of fine express engines which took part in those memorable "races." But I venture to think that some of my own experiences of them with heavy loads are still more remarkable.

My illustrations are reproductions of official photographs of the engines taken at the Crewe Works.

My illustrations of "Precursor" and "Penrith Beacon" are reproductions of official photographs of the engines taken at the Crewe Works. An illustration of "John Ramsbottom," as originally constructed by Mr. Webb on Mr. Ramsbottom's design,

appeared on page 322, Vol. I., of the RAILWAY MAGAZINE. This also was reproduced from the official photograph. My fifth illustration, that of "Dalton," is from a private photograph.

The first and second illustrations are of the single-wheeled express engines which, on the North Western line, preceded Mr. Ramsbottom's often-illustrated "Problem" class—Trevithick's 6ft. single ("Vesta") and Allen's 7ft. single ("Pegasus"), both long ago broken up. They exhibit the germ of Mr. Ramsbottom's idea. The illustrations show them as rebuilt by him, with his patent safety-valves, and with the standard pattern of dome-cover.

(To be continued.)



THE WEEKLY TRAFFIC RETURN

By JOHN PARTINGTON, *Chief of Audit Dept., London and North Western Railway*



IN an article which appeared in the RAILWAY MAGAZINE for September, 1897, I remarked that the weekly budgets were by no means facts, and I will now endeavour to justify that statement.

Doubtless the origin of weekly traffic returns was due to the practice of railway companies many years ago keeping their accounts weekly instead of monthly, and to their business being nearly all of a ready-money character. Then the return was valuable, and easily prepared, as the cash paid in to the treasury was almost identical with the amount due for traffic carried. Now monthly accounts, credit to traders, settlements with other companies, and the Clearing Houses for traffic in which two or more parties have an interest and at intervals in many cases extending over a period of six months, make the weekly returns of necessity consist largely of estimates; even passenger traffic, which is almost all "over the counter," is complicated beyond measure. Season ticket receipts, annual contracts, parcels traffic (much of which is conducted on credit), parcel post, and other items of a miscellaneous character, apart from the division of moneys received for through-booked passengers in which other companies and leased or worked lines are interested, make weekly actual receipts hard to measure.

Perhaps the most difficult element to appraise is the income from traffic originating and passing beyond a company's system, which is designated "through through" traffic. Information regarding this comes to hand about six or eight weeks after it is carried, and at the close of the half-year, or twenty-

sixth week, two months' receipts therefrom are guess work, and the intervening periods can only be tested long after date.

From observations made by the Press and financial journals it would appear that there is a notion that the aggregate increase or decrease published in the twenty-sixth weekly issue should accord very nearly with the increase shown in the half-yearly reports, but upon reflection it will be seen that only in a leap year, and then only in the first half, would it be possible for them to synchronise. In the first half of the year, for example, there are (except in leap year) 181 days, and consequently the half-yearly report contains one day less than the twenty-six weeks; further, the first week never hardly begins on January 1st or July 1st, and, for the purpose of accurate comparison, odd days have to be either added to or deducted from the twenty-six weeks' totals to arrive at the calendar six months' figures. The effect of these disturbing causes is set out in the tables appended hereto which show for four years how this operates upon the revenue of the six principal English companies. A striking instance of a factor of this kind upsetting comparison was in the year 1896, which was leap year. The half-yearly reports ending June contained in that year 182 days, as compared with 181 days in 1895, whereas the twenty-six weeks' publication embraced 182 days in both periods. The extent of this may be gauged when it is mentioned that a day's receipts on one of the six companies' undertakings is worth over £40,000. In the second half-year there are sometimes twenty-seven Sundays, and when the current year contains

this extra Sunday, and consequently one week-day less, the comparison with the twenty-six weeks always containing twenty-six Sundays is affected on a heavy line to the extent of as much as £35,000—the difference between the receipts taken on a Sunday and on a week-day. It is that much more when the twenty-seven Sundays are in the corresponding period of

the previous year, and relatively less when they occur in the current year. Leap year produces a similar surplus or deficiency whenever it recurs. Again, a year contains fifty-two weeks and one day, and as years roll on the issuing of fifty-two weekly traffic returns does not exhaust the year's receipts, and about every five years it is necessary to issue a twenty-seventh week's return, or a week without a number. It is curious how the companies differ as to when this twenty-seventh weekly return, or return without a number, should appear. The ruling guide ought undoubtedly to be this: If in the current period a week contain four or more days which relate to the first or last month of the half-year, then it should be in-

cluded in that half-year, not otherwise. Some weekly returns have been issued as relating to a particular half-year, although six out of the seven days had no reference to January, June, July, or December, as the case may be!

It would be possible to cover up these interfering causes by making the increase or decrease tabled in the twenty-sixth week's return tally with the figure which

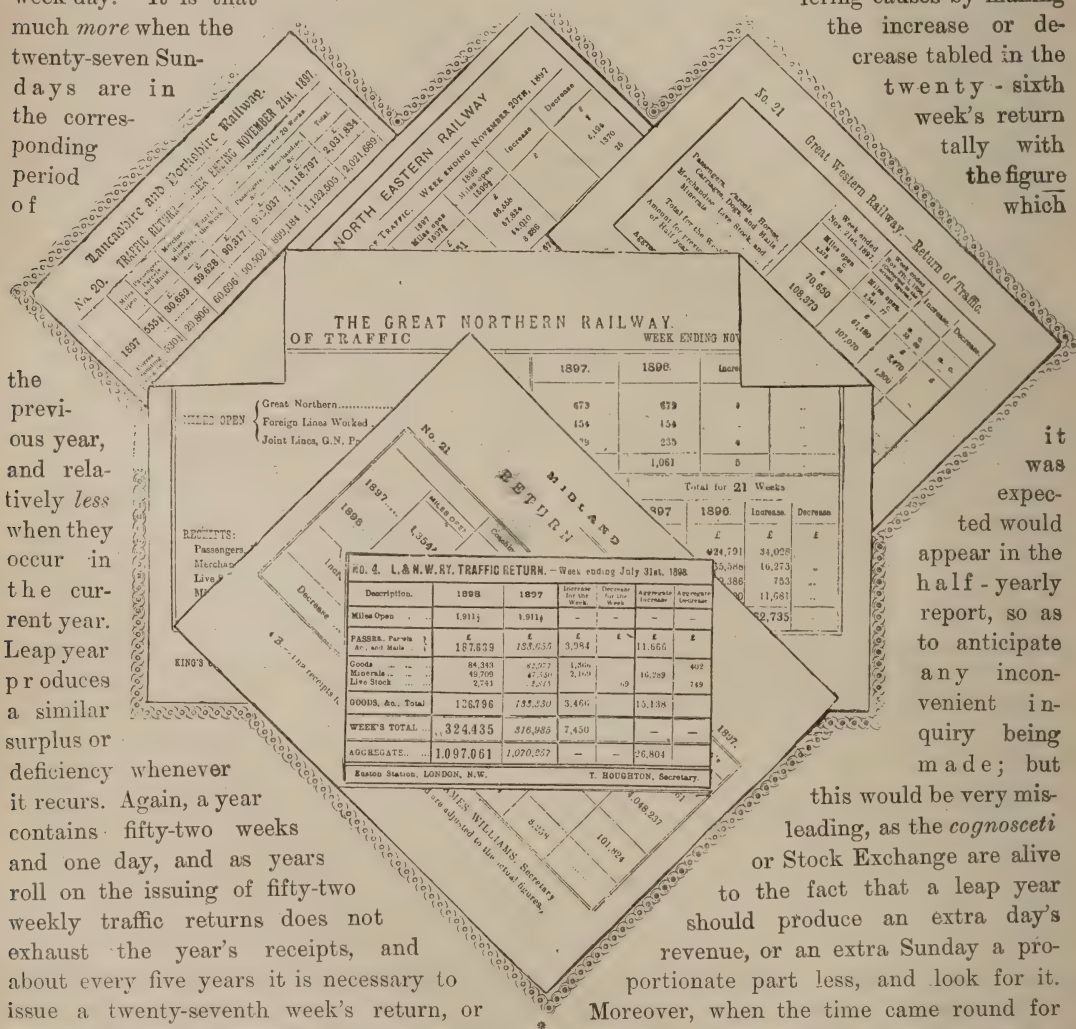
it was expected would appear in the half-yearly report, so as to anticipate any inconvenient inquiry being made; but

this would be very misleading, as the *cognosceti* or Stock Exchange are alive to the fact that a leap year should produce an extra day's revenue, or an extra Sunday a proportionate part less, and look for it.

Moreover, when the time came round for adjustment of the figures for the purpose of comparison with the succeeding year's weekly returns, the "seasoning" would have to be eliminated, and the false flavouring would then be sure to attract attention.

Under-publication is to be expected in most companies' returns, for no prudent man, be he an accountant or not, would omit to make

Specimens of the forms used by six English railways for the weekly traffic return.



provision for contingencies, and as the figures for the corresponding period are made to accord with the report, and so are properly enhanced, the current weekly return being minus this retention would from this cause show a smaller increase or larger decrease as the case may be than the half-yearly report. At times this is not visible, and the weekly publication is *over* stated, apparently with no obvious reason; but there is a cause frequently underlying this seeming error, which I will endeavour to make clear.

Supposing in a June half-year the first week ended January 5th, and the last June 29th, the corresponding period would fall, first week January 4th, and the last June 28th.

For exact comparison with the half-yearly report it would be necessary to *deduct* from the current 26 weeks Monday, the 30th, and Tuesday, the 31st of December, for receipts included in the first week, which would not relate to the month of January, and to *add* Monday, the 30th of June, which would be included in the first week of the following half-year. Then there would have to be *deducted* from the corresponding twenty-six weeks' total Monday, the 29th, Tuesday,

the 30th, and *Wednesday*, the 31st of December, and *added* Monday, the 29th, and *Tuesday*, the 30th of June.

Now, inasmuch as June receipts are more valuable than December, the net effect would be that by deducting one more day from the first week in the corresponding period, and adding one more day in the last week than in the current half-year, the figures for the corresponding period would be increased by the difference in the volume of traffic between a December and a June day; in the case of a large company this would be some thousands of pounds. That is to say, instead of taking the *accumulated increase* for the twenty-six weeks as published, the *aggregate traffic* for the twenty-six weeks would be supplemented by something considerable in the corresponding period to make it coincide with the half-yearly report, thereby reducing the

accumulated increase for the twenty-six weeks by this figure, or enhancing a decrease, if that were published, to that extent.

In the presence of all these surroundings too much

importance should not be attached to the weekly bulletins, which, to say the best of them, are but finger-posts. That they

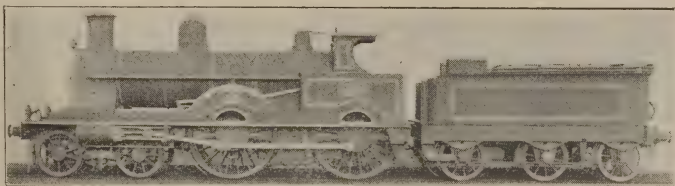
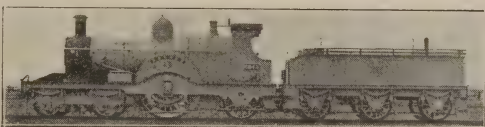
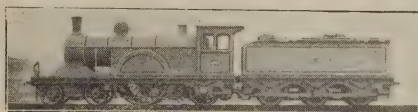
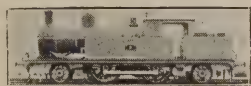


DIAGRAM SHOWING THE RELATIVE VOLUME OF TRAFFIC ON THE SIX PRINCIPAL ENGLISH RAILWAYS FOR THE YEAR 1893.

- No. 1.—Lancashire and Yorkshire, £5,141,000.
- No. 2.—Great Northern, £5,342,000.
- No. 3.—North Eastern, £8,260,000.
- No. 4.—Great Western, £9,768,000.
- No. 5.—Midland, £10,744,000.
- No. 6.—London and North Western, £12,905,000.

must differ from the half-yearly report figures is certain, and that they should occasionally seem to be wide of the mark is only reasonable, but if the officer responsible for their accuracy were granted a hearing he would probably be able to justify himself to the full. With such a compendium of reasons available, some only of which I have mentioned, it would not reflect much credit upon him if he failed to do so. It was once explained at a half-yearly meeting about twenty-five years ago that a

station clerk in the country had furnished inaccurate figures, and that was the cause of the two results being so very much at variance.

I am afraid that to-day such an excuse, however true it might be, would not satisfy the heckling proprietor who addressed the chairman on the subject, and that the responsible officer, whoever he might be, would have many a *mauvais quart d'heure* before his share in the blunder would be forgotten.

TABLE SHOWING A COMPARISON OF THE TWENTY-SIX WEEKS PUBLISHED TRAFFIC RECEIPTS WITH THE HALF-YEARLY REPORTS OF THE SIX PRINCIPAL ENGLISH COMPANIES IN TOTAL.

YEAR 1896 COMPARED WITH 1895, AND 1898 WITH 1897.

PARTICULARS.	June Half-year.		December Half-year.		PARTICULARS.	June Half-year.		December Half-year.	
	Total Traffic.	Increase or D'cr'se.	Total Traffic.	Increase or D'cr'se.		Total Traffic.	Increase or D'cr'se.	Total Traffic.	Increase or D'cr'se.
26 Weeks 1896	£2,744,000	£1,221,000	£2,238,000	*£836,000	26 Weeks 1898	£24,361,000	*£532,000	£26,871,000	*£696,000
Balance of Odd Days..... 1895	21,237,000	†745,000	24,318,000	*675,000	Balance of Odd Days 1898	23,529,000	*651,000	26,044,000	*715,000
Days..... 1896	Ad 48,000	—	Ad 234,000	—	Days 1898	Dt 138,000	—	Ad 286,000	—
" 1895	Dt 121,000	—	Ad 254,000	—	" 1897	Dt 124,000	—	Ad 267,000	—
Six Months Total 1896	22,792,000	—	25,472,000	—	Six Months Total 1898	24,223,000	—	27,157,000	—
" 1895	21,116,000	—	24,572,000	—	" 1897	23,407,000	—	26,311,000	—
Report Figures.. 1896	22,825,000	*1,423,000	25,585,000	*973,000	Report Figures.. 1898	24,333,000	*689,000	27,284,000	*863,000
" 1895	21,402,000	†574,000	24,612,000	*861,000	" 1897	23,644,000	*819,000	26,241,000	*836,000
Report figures in excess 1896	33,000	202,000	113,000	137,000	Report figures in excess 1898	110,000	157,000	127,000	167,000
" 1895	286,000	171,000	40,000	136,000	" 1897	237,000	168,000	110,000	121,000

* D notes Increase

† Denotes Decrease.





"Copper-Nob" and train crossing the Kent Viaduct, upon the Opening Day, August 26th, 1857

AN OLD LOCOMOTIVE

By W. F. FANCEY



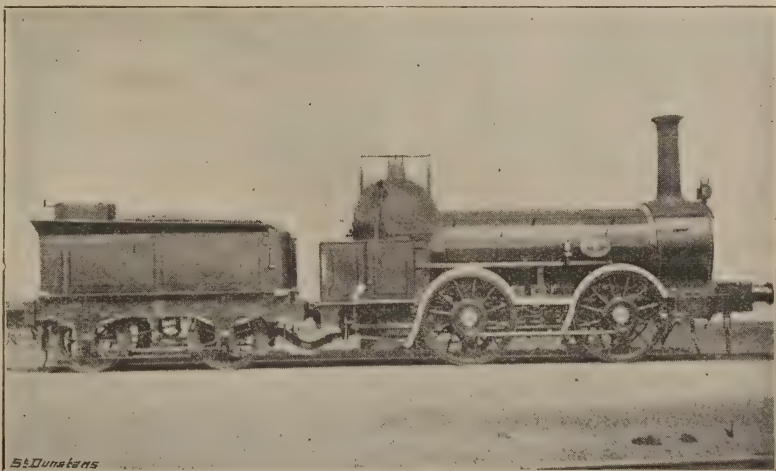
THE end of the year 1898 saw the last of engine No. 3 of the Furness Railway. For a long time this engine was the oldest at work in the world. Known as "Old Copper-Nob," it has been

of great interest to many who have seen it working daily on the docks at Barrow-in-Furness. It may interest many if a short account is written of the history of this old engine, which has been at work for nearly fifty-three years. The preservation of it as a monument is well worthy of consideration.

Before giving this history it may be well to give a sketch of the traffic in iron ore raised in the district of Barrow-in-Furness previous to the opening of the railway in 1846. All ore raised in this district up to 1846 had to be carted to Barrow, a distance of six miles, at a cost of 3s. 6d. per ton, and there deposited in depôts, four of which were erected in the channel clear of high-water mark, and belonged to the various iron-ore companies then existing. A pier or viaduct was taken from each dépôt to the channel at which the vessel was moored to receive the ore tipped from trollies used for the purpose at any time of the tide. Vessels from 100 to 300 tons were mostly employed. At low water the channel was dry.

When the railway was opened from Dalton and Crooklands to Barrow, a distance of 5½ miles, the depôts at these places were arranged for tipping the ore direct from the carts into the wagons as required. Soon after the opening of the railway the Lindal Moor Mining Company laid a narrow-gauge tramway, worked by steam, from their pits to Crooklands on to a stage over the wagons, and the ore dropped directly into them, thus saving all cost of cartage.

About 600 tons of ore per day continued to be shipped until 1851, when the late Mr. Schneider fortunately found a large deposit at Park—now called Park Mines. The late Charles Kennedy, of Ulverston, also found a very large deposit close to that of Mr. Schneider's, called Roan Head. From this time the rise and progress of Barrow has continued.



"OLD COPPER-NOB." NO. 3, FURNESS RAILWAY

The ore shipped from the opening up of other mines until 1857 averaged about 3,000 tons daily.

In 1854 the line was extended to Lindal, in the neighbourhood of which were most of the pits. This was taken advantage of by the owners, who laid tramways of 4ft. 8½in. gauge to their pits, to which the railway company's wagons were taken and the ore dropped into them direct, thus doing away with carting, excepting those which were too far distant from the main line.

In 1846 the Furness Railway Company were possessed of four locomotives—Nos. 1, 2, 3, and 4. No. 1 was sold many years ago to a contractor in the North of England; No. 2 was broken up many years ago. Those two engines had cylinders of 13in. diameter by 24in. stroke; four wheels coupled, 4ft. 6in. diameter; steam pressure, 80lb. per square inch. No. 4 was working until January, 1898; No. 3 worked until the end of last year. The cylinders are 14in. diameter by 24in. stroke, with valves between the cylinders; steam pressure, 110lb. per square inch; four wheels coupled, 4ft. 9in. diameter; wheel base, 7ft. 6in. The boiler is 3ft. 8in. mean diameter and 11ft. 2in. long; it contains 136 tubes, 2in. diameter, the total heating surface being 940 square feet. The engine weighs 19 tons, and the tender 13 tons in working order. The tender has four wheels, 3ft. diameter; wheel base, 6ft. 9in.; and carries about 2½ tons of coal. The tank capacity is 1,000 gallons.

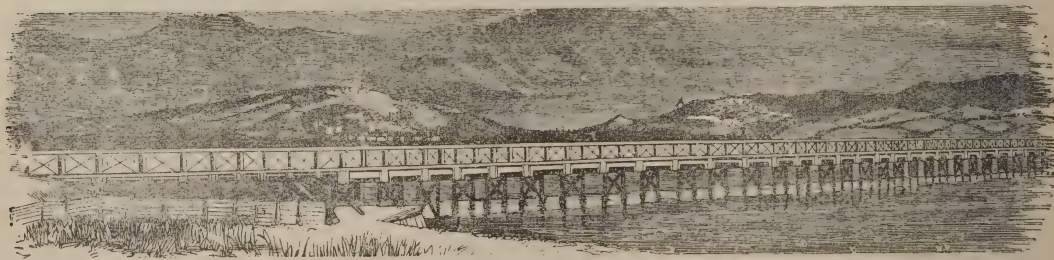
The prominent feature of this engine is the round-back fire-box, with dome-top covered

with a copper casing, from which it derives its name—"Copper-Nob." It has bar framing and round connecting and coupling rods, as will be seen from the illustration. The engines have no cabs, and the men on the footplate were very much exposed. The engines were built by Messrs. Bury, Curtis and Kennedy, of Clarence Foundry, Liverpool, and shipped by them to Barrow in 1846.

Barrow at this time was not possessed of power for lifting them out of the ship, consequently sheer-legs were erected, and, after several slight mishaps, No. 3 was landed on the beach, thence on plates and temporary lines to the nearest part of the main line, on which she was placed and taken to the sheds, where all the motion and gearing were put together, and the tender supplied with coal and water in readiness for steam. Since then these engines have taken their share of work on the main line, and at all times did their work most satisfactorily.

It is difficult to get the mileage of No. 3 engine, as previous to 1857 it was not kept, but there can be no doubt it will amount to a very high figure. The axles have been renewed three or four times, but the original framing, wheel-centres, and slide-bars remain.

During the time this engine was running on the Furness Railway it was in the charge of Mr. Richard Mason, late Locomotive Superintendent, who always took a great interest in the "Old Copper-Nob."



"Copper-Nob" and train crossing the Duddon Sands Viaduct, Furness Railway, upon the Opening Day, October 29th, 1850.

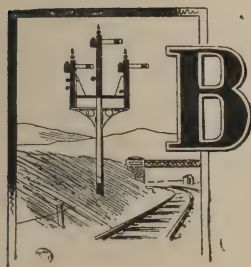
THE COUNTRY TERMINI OF THE (LOCAL) LONDON RAILWAYS

RAILWAY COMPANIES
Metropolitan District Railway
Metropolitan Railway
North London Railway

TERMINI.
{Richmond,
Ealing,
Wimbledon,
Richmond.
{Richmond,
Kew.

By W. J. SCOTT, B.A.

(Concluded from February)



BEFORE beginning the promised notes on the towns of Richmond and Ealing, considered as friendly rivals, it is needful to say a word of explanation as to the Richmond train services dealt with on page 125 of the February number. A correspondent rightly points out that the 8.24 and 8.54 a.m. up trains are worked by the Metropolitan Company, not the Great Western. How, with "No. 1a" section of the Great Western working-book before us, we yet set them down to the latter company we cannot explain—we think it was due to hypnotic suggestion by those malicious fairies who once tormented Professor Crookes. At this present time the 7.45, 8.24, and 8.54 a.m., the 12.56, 4.56, 8.56, and 10.56 p.m. trains from Richmond (New) to Aldgate, etc., are worked by the Metropolitan Company—the other ten trains being all Great Western. The same correspondent demurs to the statement as to the Metropolitan trains "starting from New Cross"; but, as a matter of fact, a majority of the down trains—four out of seven—do start thence, though seemingly only the 7.45 a.m. up works through to that point.

A glance at the District Company's familiar map shows that Richmond and Ealing lie ex-

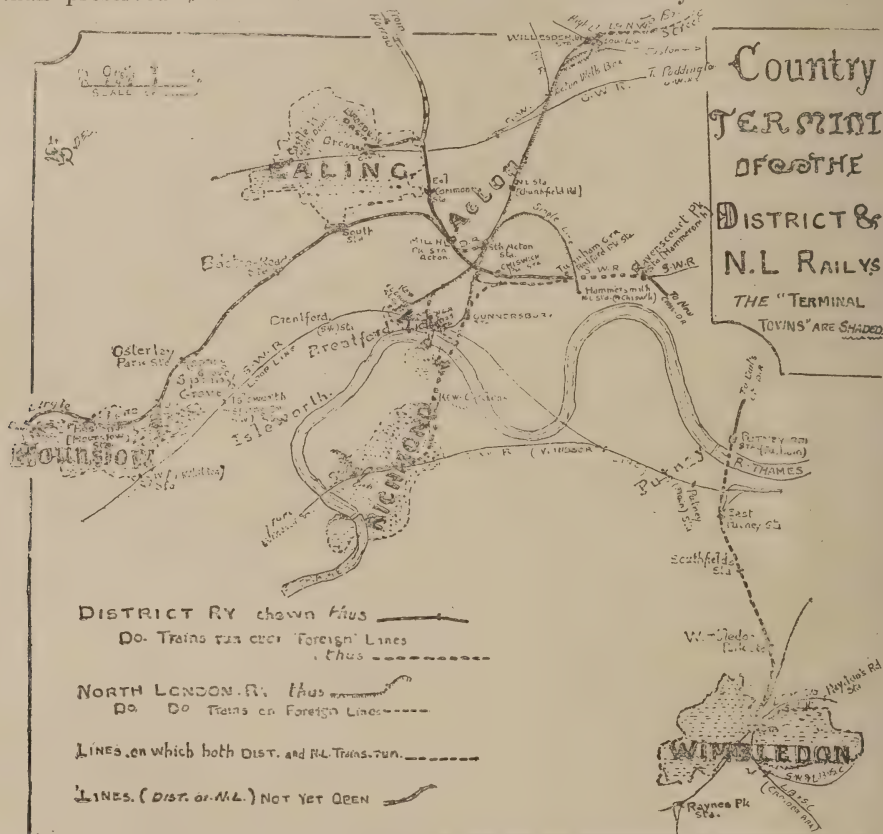
actly the same distance west of London; the former is rather nearer to the official bounds of "Londonshire," but slightly further out by rail than the latter place. Save for this nearness to the great city there is little or nothing to distinguish Richmond from any thriving residential town in the provinces, unless it be that its shops are exceptionally handsome. The new "Town Hall"—corporation offices rather, as there is no "hall" in the building—is an ambitious semi-classic structure with a fine projecting clock; unluckily the least imposing of its three façades is turned to the main street. The theatre and assembly rooms opposite to it (also corporation property), and the court house are useful but not striking edifices. Neither are the parish churches (St. Mary Magdalene's is ancient, but a daughter to Kingston) of much architectural interest. The post-office, however, is more than respectable, and there is a perfect wealth of hotels, from the lordly "Star and Garter" downwards. With wider streets the town would be very handsome*; unluckily these are mostly narrow without being picturesque, while the lack of open country (except the Park itself)

* The population of Richmond is not easy to reckon, as the borough includes some places outside of Richmond, while there is a fair-sized suburb—"East Twickenham"—on the Middlesex side of the Thames which practically belongs to it. Perhaps 30,000 would be a fair estimate.

on the outskirts is a serious drawback. In these last respects it is a great contrast to **EALING**.

The latter town having been formed in the present half-century from an old village and some by-lying hamlets, has kept the wide roads and green spaces of its rural days; in fact, by judicious planting of trees along most of the thoroughfares, the local Council has more than preserved the rustic amenities.

when first opened the Great Western Station (now Broadway) was about a quarter of a mile east of the northern end of the village; it is in the heart of the modern town, which stretches for some mile and a half along the main Oxford (or Uxbridge) Road. Mid-way on this length stands one of the finest group of Public Buildings—comprising municipal offices, library, a great hall, baths, and fire station—which any town below the rank of



This joined with some good (though short) streets of shops—quite up to the average of country towns, though not as yet abreast of those at Richmond—makes a "garden city" with open villa suburbs of the type of Tunbridge Wells or Cheltenham; there is little or nothing to suggest the "suburb" except the "W" of the postal address.

The ancient village—"Great Ealing," and in pre-Norman times "Yelling"—lay off the high road on a cross road to Brentford, so that

a great city can show; indeed, the town hall proper (known as the "Victoria Hall") and the council chamber are both rooms which any city might be proud of.

Not far off stands the church whose beautifully-proportioned spire is seen by all who fare to and from London by the Great Western. This is Christ Church, the most central building in the town, but not properly what the Great Western guards always call it, "Ealing Church." For the original Ealing Church (now

St. Mary's, South Ealing) stands a mile away near the station on the Hounslow branch; it was re-built in a kind of Byzantine style about thirty years ago, but is on the site of a most ancient foundation. It has in Ealing five daughter (or grand-daughter) parishes (besides two in Brentford), making, with their chapels-of-ease, eight churches in all; with one exception all the parish churches are of some architectural merit, and stand where they strike the eye. This is true also of some of the local banks, one of which (close to Broadway Station) was the original town offices before the present Municipal Buildings were reared, ten years ago; chapels, schools, and clubs are numerous, and a fine theatre is now in its foundation stage. Though it has an excellent hotel adjoining Castle Hill Station, Ealing is far behind Richmond in this respect, and its head post-office is a woful makeshift. It has not yet risen to Richmond's rank as a "borough," though we understand that a charter of incorporation is looked for very speedily; on the other hand, it (like Wimbledon) gives its name to a Parliamentary division, for which it is the place of nomination and election, while Richmond is within the Kingston division. Its population, said to be about 35,000, grows by leaps and bounds, and the local death rate is abnormally low. This, no doubt, is partly due to good municipal government, and partly to the open country which almost surrounds the town—not the cabbage gardens of southern Middlesex, but real country with farms and hedgerows, and clumps of timber.

The Ealing extension of the District Railway, which branches out from the South Western (Kensington, etc.) at the Turnham Green signal-box, has already been spoken of. At "Mill Hill Park" the District Company's Acton Station†, it throws off an important shoot, some miles long, to Hounslow, passing

through the southern end of Ealing, and also by Spring Grove, to a terminus on the Bath Road at the extremest western verge of Hounslow. One intermediate station, Boston Road, does not belong to any place at all, being on the open road mid-way between Brentford and Hanwell—it seems not unlikely that in a few years it will have become a sixth station for Ealing, as a great outgrowth of that town on its south-western side is just beginning. Originally the "Barracks" section of this extension was worked as a single line spur from Osterley Station, the main branch trains run-



"CASTLE HILL" STATION
(Ealing Goods and Coal Dépôt, Great Western Railway)

ning to a terminus in the High Street of Hounslow, now closed and left to decay—a melancholy sight. But Hounslow is a melancholy town, and we gladly catch at the plea of its having no through London trains off the District line to escape from describing it among the "terminal towns."

Ealing's first and for nearly thirty-three years its only station was opened at almost the same time as Wimbledon; just a fortnight later, in fact, on June 4th, 1838. The earliest "Bradshaw" (November, 1839) gives the table of the Great Western main line as open to Twyford—in 1838 "Maidenhead" (a now vanished station on the Taplow side of the Thames) was the temporary terminus. Bradshaw's table gives the times of departure from Paddington, and from the up starting points respectively, and a very incorrect mileage column, but no intermediate stops or hours of

† It is a great pity that the word "Acton" is not included in the name or shown on the station-boards. "Chiswick Park and Acton Green" is really a Turnham Green station.

arrival. Ealing, however, is shown as the first station out of London, and this it continued to be until 1868. At its opening *five* trains each way called (on week-days†); ten years later, when Richmond was in all the glory of its new terminal line, Ealing enjoyed a service of nine down and ten up trains; the last down left Paddington at 7.30 p.m., and the earliest up was at 8.38; the worst gap was from 3.43 to 6.28 p.m. As will be seen (on reference to page 78, January number) that far from brilliant supply was a shade better than Wimbledon's at the same date. For many years Ealing stood bracketed with Hanwell and Southall as altogether unimportant "road-side" stations until the opening of the West London line in the spring of 1863 brought it a new service of trains, and a temporary rise in importance; for a short time it even gained some semi-expresses on the up journey, being used as the exchange station for Victoria by some of the up trains. This, however, was only for ticket-collecting reasons, and with the restoration of a Paddington ticket platform (now Westbourne Park station) its factitious importance came to an end in 1869. Meanwhile the large straggling village (as it then was) had grown in all directions, and in March, 1871, a second station, to accommodate the western end of the place, and also to supply it with a goods yard, was opened. This was named "Castle Hill," a name suggested by the fact of the ground there being dead level, and the nearest castle being at Windsor—or the Tower of London. It still remains the only station at Ealing which is a goods and coal depôt, and a landing for horse and carriage traffic. The population lying within a half-mile of it is now considerably more than that of the whole town in 1871. From the day of its opening it was used as the terminus and starting point for a few short trains, which ought to have proved the beginning of a good service of "locals." But so badly were the Great Western suburban tables then framed that within a year of the opening of "Castle Hill" the actual train accommodation of

Ealing was, if anything, less than before, at least as many "stops" being struck off as there were new locals put on. Naturally the inhabitants grumbled; the fast-growing population of both Ealing and its Londonward neighbour, Acton, caught Mr. Forbes's watchful eye, and in 1877 the District Company brought in a Bill for their present Ealing extension, and carried it at the first attempt. Next summer (June and July, 1878) the Great Western, having partly widened their main line, put on a fairly ample suburban service, mostly consisting of locals between Paddington and Southall; this greatly added to the actual number of trains calling at Ealing, but did nothing to exalt its position relatively to its neighbours. Its turn soon came, however, the new line from Turnham Green was pushed forward with wonderful speed, and in July, 1879, it was opened to its present terminus, close to, but quite detached from, the old (now "Broadway") Ealing Station of the Great Western with an intermediate station, called "Ealing Common," on the eastern outskirts of the town. This at one stroke gave Ealing two new stations, made it a chief terminus of the District Railway, and supplied it with a regular half-hourly service. This service the District Company have gradually added to by running earlier and later trains, and by putting on two additional ones each hour during part of the "business hours," morning and evening, but latterly they have allowed the Great Western to catch and then outstrip them in this respect. In 1884 they also opened the Hounslow branch, with a "South Ealing" Station, near the ancient (but rebuilt) St. Mary's Church. Stirred up by competition, the Great Western began, from 1882 downwards, to give numerous additional stops to Ealing; it was not, however, until the last five years that they conceded a service which at all kept pace with the town's rapid growth, or corresponded to its importance. In the summer of 1894, several through fasts (or "third-rate expresses")—four down and two up—were allowed to call at Broadway, Ealing, and from that date it has been reckoned among the

† On Sundays there were four each way—a surprisingly high ratio to week-day number.

"principal" stations. As will be seen from the following table its present supply of trains is more than respectable:—

TABLE OF EALING TRAIN SERVICES
(DOWN).

1.—AT BROADWAY, G.W. STATION.	
(a) Main line through trains, expresses or fast	5
Suburban fast trains (Windsor, Wycombe line, or Reading)	8
Suburban stopping trains (Southall, Uxbridge, Windsor, or Maidenhead)	43
Total number of trains from Paddington*	56
(b) Branch Services—	
From Victoria (L.C. and D. Station)	8
From Willesden Junction, in connection with N.L.R.	13—21
Total number of G.W. trains	77
2.—AT BROADWAY, D.R. TERMINUS.	
From Whitechapel, Mile End (or New Cross, Brighton Rwy.)	34
Starting from Mansion House, Kensington High Street, or Earl's Court, etc.	10†
Total District Rwy. trains	44
WHOLE NUMBER OF TRAINS FROM LONDON.	
Great Western (main, 56; branch, 21)	77
District	43
TOTAL	120

* These are through from Aldgate (Metropolitan); they call at the Bishop's Road platforms at Paddington.
† Includes one local from Acton (Mill Hill Park).

All the District trains start from or terminate at Ealing. There are no Great Western "locals" to or from Ealing at the present time; all the Willesden or Victoria branch trains (except such Victoria ones as work through to Windsor, etc.) use Ealing Broadway as the junction or "exchange station" for all main line stations beyond Southall.

In number of trains Ealing is a long way behind Wimbledon, and in variety of companies it is still further below Richmond, but in one most important matter it is far ahead of the other two towns.

It has a most excellent supply of stations, as the accompanying plan shows. If circles of a half-mile radius be described with each of these as a centre, it will be found that almost every house in the place, except the northern side of the Castlebar Hill suburb (this side does not come into the plan), lies within one at least of these circles. The stations themselves are all satisfactory buildings, while the two Broadway ones are distinctly first rate. "Broadway, Great Western," is now undergoing further enlargement; when this is finished its three platforms will be over 200yds. long, with a good proportion of this length covered by the best type of "verandah" roof; the walls and waiting-rooms are all of brick with

stone dressings, and upstairs the booking-office front, in spite of its awkward position, is a handsome one. The only thing lacking is a covered way into the neighbouring terminus of the District Railway. The latter station is less imposing outside than the Great Western one, but within it enjoys the exceptional glory of being "roofed in" with a glass span. This, with a "curtain" at the outer end, concrete side walls,



and two wide platforms, makes quite a model terminus of the smaller kind; on a wet day we found it a most comfortable station to wait in. The junction-spur just outside of it, by which from 1883 to 1885 the District Company worked some trains over the Great Western to Windsor, has been cut across by the aforesaid lengthening of the Great Western station, and could no longer be made use of. When the new branch to (South) Harrow to be worked by the District is opened—it is now being made in patches at a very slow rate—it is said that there will be one more Ealing station erected, one on the new line at the north-east corner of the town.

It is worth while perhaps to note that, though boasting fewer main line fasts (especially as to up trains) than Wimbledon, Ealing is spared the indignity endured both by Wimbledon and Richmond of being passed by some stopping trains which call at sundry much inferior places. All suburban ordinary trains on the Great Western have Ealing "stops," and no other station on the same line comes within twenty-five or so of its train total.

It certainly strikes us that this investigation of some train services in "Greater London" brings out all the railways concerned in a favourable light; it also shows that great trunk lines can, if pushed, provide as ample and frequent services as their smaller rivals. In this respect the South Western came out particularly well—would that they might find reason to do unto certain other places as they do by Wimbledon! In coaching stock, even for suburban and "tunnel" trains, the Great Western, of course, stand easily first; the North London vehicles are handsome outside and roomy within, but by no means luxuriously fitted. As a rule, punctuality is observed in most of the services here considered—in this respect the Great Western are most, and the South Western least, to be praised; both District and North London, as a rule, keep perfect time when not hindered by foreign trains; but then, they mostly are so hindered.

The writer's thanks are due to Mr. Richardson, of the Town Clerk's office at Ealing, for

some excellent photographs, and to an Ealing "railwayac" and old friend, Mr. B. C. Murphy, for help and information as to time-tables.

APPENDIX.

List of Running Powers or Workings over Foreign Lines by the N.L., Dist., and Met. Cos.

1.—NORTH LONDON RAILWAY.

Over the L. and N.W. (Hampstead Junction section): Kentish Town Junction (Camden Town) to Willesden (high level) and Old Oak.

Over the L. and N.W. (main line): Chalk Farm to Willesden (low level).

Over the L. and S.W. into Kew Bridge Station (from Kew Curve Junction).

Over the G.N., by arrangement only: Canonbury Junction to—(main line): New Barnet, Potter's Bar, etc.; (Enfield branch): Enfield, G.N.; (Finchley branch): Alexandra Park and High Barnet.

The above running powers relate to *coaching traffic* only; therefore goods are different in many cases.

METROPOLITAN RAILWAY.

Over the S.E.R. into New Cross (North Kent) Station, (from E.L. line).

Over the District Rwy. (exclusive of the "joint" sections) (see Note): South Kensington to Mansion House (Inner Circle service).

Over the G.W.R.: Bishop's Road (Paddington) to Westbourne Park by "subway" lines. For Hammersmith and City trains only.

Over the L. and S.W.R.: Grove Road, Hammersmith to Richmond (New). For Hammersmith and City trains only.

DISTRICT RAILWAY.

Over the L.B. and S.C.R.: Into New Cross (Brighton Station) from E.L. line.

Over the Met. Rwy., exclusive of "joint sections" (see Note): Aldgate, via Moorgate and Paddington to High Street, Kensington (Inner Circle).

Over the L. and S.W.R.: Putney Railway Bridge to Wimbledon (new platform) by East Putney.

Over the L. and S.W.R.: Studland Road Junction (Hammersmith)* to Richmond (New).

Over the West London (G.W. and L. and N.W. joint) into Addison Road Station, Kensington, by Earl's Court Junction. Powers never exercised.

Over the G.W.R., formerly ran by permission only: Ealing (Broadway, G.W. Station) to Windsor.

* A few yards east of Ravenscourt Park Station. The trains to the Ealing line also run as far as Turnham Green over the same section of the S.W.R.

Note.—Both companies work their own engines and trains round the Inner Circle in each direction; the section from the Mansion House (exclusive) going east to Aldgate (exclusive) is Joint; from Aldgate, Main (inclusive) to High Street, Kensington (exclusive), by King's Cross and Praed Street is Metropolitan; from High Street, Kensington to South Kensington (inclusive) is Joint, and thence round again to Mansion House, by Victoria, is District. From High Street to South Kensington there are four roads, the two on the west side being for District Co.'s trains, or other Companies working in connection with the D.R. only.

MULTUM IN PARVO

(THE ISLE OF WIGHT RAILWAYS)

By CHAS. L. CONACHER, *General Manager, Isle of Wight Central, etc., Railways*



I THINK this title may be said to fitly describe the multiform operations of the Isle of Wight Railways. At all events, I will set myself the task of substantiating it in what follows, and if the

article partakes somewhat of a statistical character it is because I shall thereby best attain that end.

To begin with, it should be stated that the island contains within its small area no fewer than four distinct railway companies, not to mention the line owned jointly by the London and South Western and London, Brighton and South Coast Railways between the three stations in Ryde—a fact alone that claims for itself the special recognition of my title, and it is to this reason that the public must look for much of the opprobrium that it is rumoured rests upon us, for the diverse ownership at once constitutes many of those anomalies in fares and irregularities in working which have gained for the railways of the island a somewhat unenviable notoriety.

Three of these railways are vested in the Isle of Wight Central Company, which thus controls a mileage of 40 miles, whereas the Isle of Wight Railway owns the remaining $14\frac{1}{2}$ miles; the Ryde Pier Railway, worked over by the two island companies, bringing up the total mileage operated to 56 miles, shortly to be augmented by $1\frac{1}{2}$ miles upon the completion of the extension of the St. Lawrence line to Ventnor.

Dealing first with the passenger traffic, the following comparisons will serve to show that my title is not misapplied in this respect. In 1897 no fewer than 1,500,000 persons were conveyed on the island lines upon a train mileage of 318,000 miles; whereas on the Hull and Barnsley Railway, 77 miles in length, and connecting populous centres, practically a fourth of that number only were carried, with an increased train mileage of 120,000 miles. The fact that a full third of this number are conveyed during the three summer months of July, August, and September will best illustrate the purpose of this article, and, carrying the analysis further, it may be stated that the Cambrian only conveyed 720,000 more people on their 250 miles of line in the same period, the Furness Company but 840,000 more in their busy district, and the Highland Railway, with their heavy tourist traffic and a mileage of 473 miles, only 470,000 more.

A still more striking contrast, perhaps, is to be found in the fact that on the Midland Great Western of Ireland, although possessing ten times the mileage, 220,000 fewer people were conveyed; on the Midland and Great Northern Joint Railway, with 180 miles of line, 100,000 passengers less; the Somerset and Dorset, 101 miles in length, 400,000 less; whilst the Rhymney Railway, serving populous districts and controlling 71 miles, carry no more than the island lines, whereas the Brecon and Merthyr, 59 miles long, fall short by 900,000. From this it will be evident that the Isle of Wight Railways play no mean part in the passenger traffic of the country, and, indeed, are in the van for the high rate of

earning per mile of line. There are several causes that contribute to this. True, the higher fares than rule on the mainland are a factor, but the travelling propensities of the island folk is perhaps the principal reason for such favourable results. At times the traffic is abnormal and almost beyond the resources of the companies, such as during Cowes Regatta week in August, when no less than 62,000 people are carried, whilst an ordinary

largely augmented as it is by the visitors, brings the average number of people conveyed per week at that season of the year to the very respectable total of 40,000—one-half the resident population of the island. Pleasure parties, school treats, etc., go to swell this number, no fewer than 110 such parties being arranged on the Central during the past season, representing 10,000 passengers. It is thus not surprising that a sigh of relief escapes the



INTERIOR OF THE FITTING SHOP OF NEWPORT WORKS, ISLE OF WIGHT CENTRAL RAILWAY

Bank Holiday will attract 12,000 passengers. A two days' race traffic at Ashey will bring 3,000 people, whilst 600 will turn out freely for a football match between rival towns, 7,000 will take up a favourite excursion booking between Newport and Cowes in the summer months, and 2,000 will book at Newport in a single day on a popular festival. Throughout the summer carnivals, regattas, flower shows, illuminations, etc., succeed one another all over the island with amazing rapidity, each town vying in the attempt to excel the other. These all attract a considerable traffic, and,

tired official when autumn intervenes to check the stream, although, as will be seen later, he even then only turns his attention to another quarter.

Whilst the foregoing might be deemed sufficient in itself to justify my title, I should leave my subject very inadequately dealt with were not the remaining sources of the companies' revenue, though less in proportion to the passenger traffic, remarked upon. At the risk, therefore, of wearying your readers with so confusing an array of figures, I will venture to pursue my theme and treat briefly

of the heavy goods and mineral traffic conducted in the island when the busy throngs of passengers have passed by.

The island, for the most part, is supplied from without with the necessities of life, coal being altogether imported. For this traffic both companies make a very strong bid, but the Central Company are more favourably situated



"No. 3," ISLE OF WIGHT CENTRAL RAILWAY
The shunting engine at Cowes Wharf

in this respect, possessing as they do in their Medina Wharf at Cowes a quay well adapted to deal with a very considerable trade, and accessible at almost all states of the tide. Aided by three powerful steam cranes and all other necessary appliances, the Central Company were able to effect the discharge of 122 steam colliers in 1898, representing a tonnage into trucks of 73,000 tons. With the most complete facilities, they can deal with boats of 1,000 tons burden with ease and despatch, and colliers of large tonnage trade regularly throughout the year between the wharf and the Welsh and Tyne ports.

But this is not the only business dealt with at Medina Wharf. Large cargo boats can equally be accommodated, and many such are discharged annually. Messrs. Pickford's steamers call daily from Southampton and Portsmouth, and thus establish direct communication for goods traffic with the mainland, the firm acting as sole agents to the Company for such traffic generally. Minor craft, with various cargoes, are continually being dealt with, and the gross general merchandise traffic

handled at the jetty for 1897 was 10,000 tons. For this work a special locomotive (No. 3) was designed, more perhaps for use than for ornament, as the accompanying illustration will show. At St. Helen's the Isle of Wight Company have a quay, where, however, the business is on a smaller scale. This is due to no want of facilities for discharging, but to the uncertain

access to the harbour, which enables Cowes, with its superior natural advantages, to command the principal trade of the island, an advantage which the Central Company have not been slow to use. To their many activities the railway companies have thus to add the shipping business. Relatively, the Isle of Wight Company have a more considerable passenger traffic, but the Central Company control

the larger goods traffic. The respective tonnages for 1897 were: Isle of Wight Central Railway, 145,000 tons, and Isle of Wight Railway, 84,500 tons.

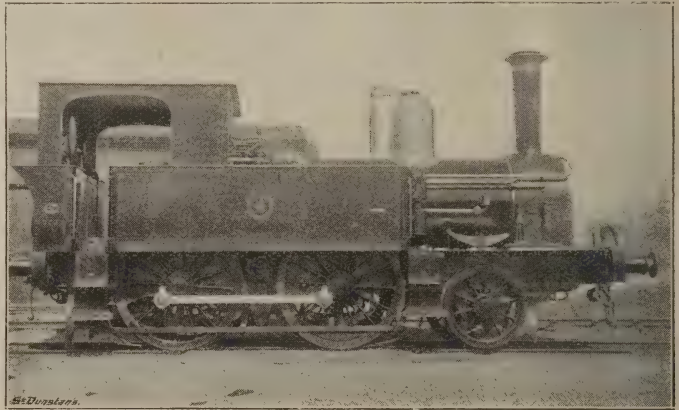
In the matter of train mileage the Island Railways take a position amongst much larger lines. The frequency of the passenger trains necessary to the conduct of so large a traffic, and the fact that the island railway system being entirely made up of branches, seven in all, requires so many distinct services, fully account for the large mileage run—viz., 420,000 miles in 1898. The Cork and Bandon, with 94 miles of line, incur less, but as this is the spending department it behoves me to say little else than that, seeing the short distances to be traversed conveniently permit of so many other forms of locomotion, it is necessary that the train service should be as complete as possible, and with this view no fewer than 105 passenger trains are run daily in the summer months. It is therefore not surprising that the rate of working expenses is proportionately high; but here I shrink from making comparisons which

would not be favourable to the island railways. At this point advantage might be taken to put in a plea for our passenger fares. An anathema has long been pronounced upon us in this respect, and we are urged on all hands to give Parliamentary bookings by all trains; but, desirable as that might be from many points of view, it would unhesitatingly spell disaster for the island companies under existing circumstances. I say this advisedly as one who has studied the subject, but let the figures I have given speak for themselves. It has been shown that the traffic is already as much as can be conveniently handled with the means now available. Imagine its increase twofold, for nothing short of this would recoup the companies. The rolling stock, now inadequate, as I shall proceed to show, would have to be doubled, the station accommodation and the equipment of the lines generally increased, all at heavy capital cost, whilst the working expenses under all heads would proportionately rise. No; salvation, if it comes, must be from without, and incomplete at that. It is a mere illusion to say that the passenger traffic would be even doubled. We already carry the population of the island nearly twenty times over, whilst the possible increase in the number of our ever-welcome visitors would in no sense supply the need. It is thus with regret that we are compelled to the conclusion that nothing further can be done in this respect at present.

But whilst ordinary travelling in the island may be at rates which are not consistent with general practice, we believe we can lay claim to the cheapest form of ticket issued. From April to September each year the Central Company offer without restriction a season ticket over their entire system for a week for 10s., children half price, the holder of which can with ease accomplish 500 miles of travel-

ling, and these tickets are for this reason known as "500 mile" tickets. They are available at any station and by any train for seven days, and constitute an ideal tourist ticket. In fact, there is no cheaper means of getting about the island, and their issue cannot be too widely known in view of the delinquencies with which we are universally, but unjustly, credited in this respect. The "500 mile" tickets are on sale at Messrs. Cook's and Gaze's London offices throughout the season, and at all island stations, the Isle of Wight Railway issuing a similar ticket for their line.

I have touched upon increased capital expenditure. It is now sufficiently unwieldy to arrest all progress, the debentures being in the case of the Central Company £39,000 in excess of the share capital, instead of in the usual proportion of one-third, the combined capitals of the two companies amounting to nearly £1,200,000. In fact, there are much larger concerns with less capital, and any



"No. 8," A NEW 4-COUPLED TANK LOCOMOTIVE, ISLE OF WIGHT CENTRAL RAILWAY

material increase of this would only tend to add to our embarrassments.

A word in conclusion as to our rolling stock. It might be expected that this would be in due proportion to the traffic conducted, but here I must expose our greatest weakness, and in so doing hope to vindicate my subject to the full. First, with regard to locomotive power,

our heavy traffic is conducted with sixteen* engines only, and when two used exclusively for shunting are excepted the fact is still more striking, as on this basis the Central Company's engines each often have to run 1,000 miles a week in order to cover the mileage worked. As a matter of fact, for the twelve

coaching and goods departments. Eighty-eight carriages are all that the companies can boast of to maintain seven distinct services and carry 1,500,000 passengers per annum. The Furness have three times the number, but convey little more than one-half additional passengers, whilst the Highland Company are

passing rich with 270 vehicles, yet only carry one-fourth more people. With much less traffic the Midland Great Western of Ireland have 100, and the Somerset and Dorset 40 more carriages, and instances might be multiplied to prove how ingeniously the island companies must use the stock at their command. Needless to say, it is of a heterogeneous character, as the two illustrations on this page will show. Carriages that have done duty on the Brighton line may be seen side by side



A SPECIMEN OF THE ROLLING STOCK, ISLE OF WIGHT CENTRAL R.WY.
THE OLD AND—

months ended June 30th last each engine ran an average mileage of 48,900 miles, or 940 miles per week, which is equivalent to that of a standard express engine. A new engine (No. 8), delivered in May last, of which an illustration is given, ran 27 weeks before being withdrawn for a single day, and in that time ran 28,050 miles, or at the rate of 1,050 miles per week. Some idea will thus be formed of the exceptional strain upon the Company's resources in this respect. Contrast the engine power of those railways with which comparison was made in passenger traffic, and it will be seen with what limited means the island railways conduct their heavy business; and if this paucity of stock is a marked feature in the locomotive department, it is equally so in the

with North Western coaches, North London with South Western, bogies with four-wheelers, and so on. All find one common level here,



A SPECIMEN OF THE ROLLING STOCK, ISLE OF WIGHT CENTRAL R.WY.
—THE NEW

and, "with the sickening pang of hope (of rest) deferred," eke out their weary existence in trundling up and down this fair island of ours. Certain it is that carriages are used nowhere to better advantage, whilst even horse-boxes

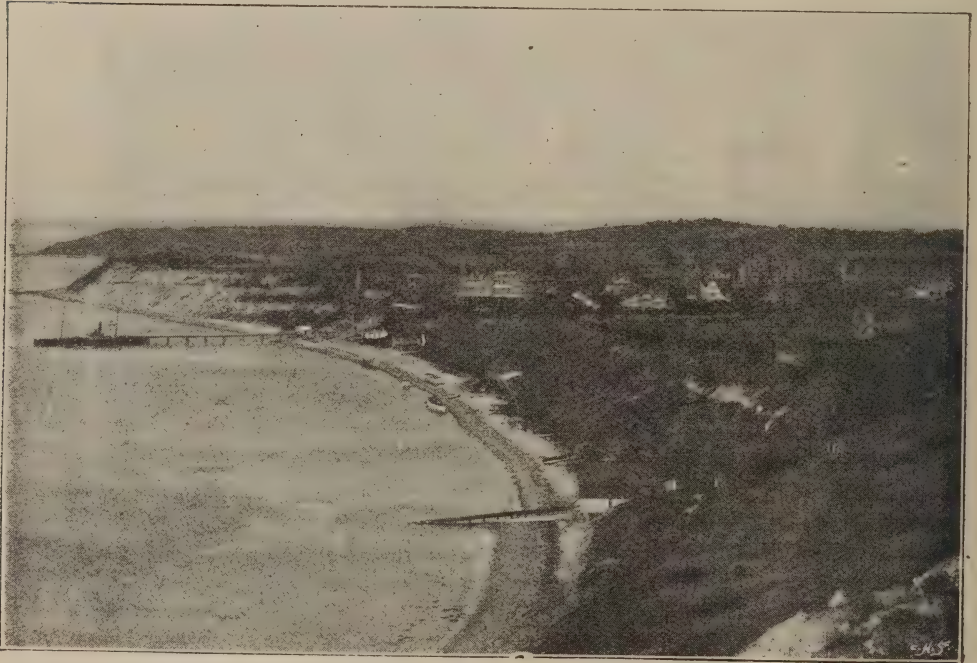
*At the moment of writing the Central Company have not unreasonably placed an order for an additional engine.

are pressed into the willing service at very busy times!

In the goods department the strain is just as severe, and it is certain there are no wagons in the country that have the same turnover. In 1897 229,000 tons were conveyed in 374 wagons, which, at an average of 612 tons to the truck, sufficiently demonstrates my point, as to accomplish this each wagon would have to be loaded with at least two tons every working day of the year. To cope with the heavy repairs to rolling stock entailed by such hard running the Central Company have well-equipped shops at Newport, and a view is given of an erecting shop, carriage shop, and turning shop all rolled into one. The Isle of

Wight Railway have equally good shops at Ryde.

Such, then, in brief, are the conditions under which the island railways are worked, and who is there now that will not make due allowance for our unavoidable shortcomings? Limited in scope, restricted in means, and burdened with capital, it is a sorry contest ours to keep abreast of the times. We do the best we can with our resources, and therefore the public should not judge us too harshly, and if a perusal of these pages will temper the views of RAILWAY MAGAZINE readers concerning the Isle of Wight railways, I shall feel amply rewarded for the labour of preparing this account of the working of its traffic under abnormal difficulties.



THE REVOLT OF THE LOCOMOTIVES

BY W. PETT RIDGE



“WELL,” said the yellow Littlehampton, indignantly, “of all the——. But, there, it’s no use an engine talking! We’ve got to put up with it.”

“It gets on my nerves,” complained S.E.R. 249. S.E.R. 249 was an anxious little tank engine, accustomed to the journey from Charing Cross to Woolwich, and tremulous, now that he had by some means shunted himself into a siding at Clapham Junction—an event due to the joint working of the South Eastern and Chatham and Dover Railways. “I try not to let it be noticed, but sometimes it’s as much as I can do not to scream.”

“They’ve been writing these letters to the newspapers for years,” said a South Western goods engine. “I can remember in my young days——”

“We’re not talking about the stone age,” interrupted a Chatham engine, who had brought the grievance under notice, “we’re talking about now. My idea is that—that——”

“Well?”

“That something,” said the Chatham, vaguely, “something ought to be done. Here’s a whole column in the ‘Times’ this morning complaining about railways, and nobody will answer the letters, nobody will take any notice.” A North Western engine gave a snort of sympathetic indignation. “Something,” added the Chatham, with a slight increase of aggressiveness, “something ought most certainly to be done.”

“But what?”

“That,” said the Chatham, handsomely, “is for you to decide.”

A white lamp waved excitedly in the distance near to the starry display of red and green lights, and the Chatham moved.

“Good night, you chaps,” he said, “think over the advice I’ve given you.”

“But!” cried the others, “you haven’t given us any advice!”

The remaining locomotives were silent for a few minutes after the departure of the Chatham. They listened to the voice of the fireman of Brighton and South Coast engine engaged in spelling out the last of the letters in the “Times” which had given the engines so much annoyance. The fireman had been presented with the newspaper, in mistake for a tract, by a generous-hearted lady passenger. “And he goes on to say,” remarked the voice of the fireman student, “goes on to say, ‘How much longer is the rap—r-a-p-a-c-i-t-y—rapakity of share-’olders, and the dense stoopidity of railway managers’—that’s a knock for old what’s-his-name—‘of railway managers to browbeat and terrorise a long-sufferin’ public.’” The fireman looked rather wistfully at a signboard in Falcon Road. “I’d like to ’ave a chance of terrorisin’ a public,” he said.

The engines listened gloomily to the reading of the fireman. The fact that no human being seemed willing to stop or contest these bitter and foolish communications to the Press enabled “A Season Ticket Holder of 120 Years’ Standing,” and “Indignans,” and “Senex,” and all the rest of the writers, to have the keen satisfaction of feeling that their absurd complaints were full of sweet reason and replete with sound argument. A red star in the sky before them changed to green.

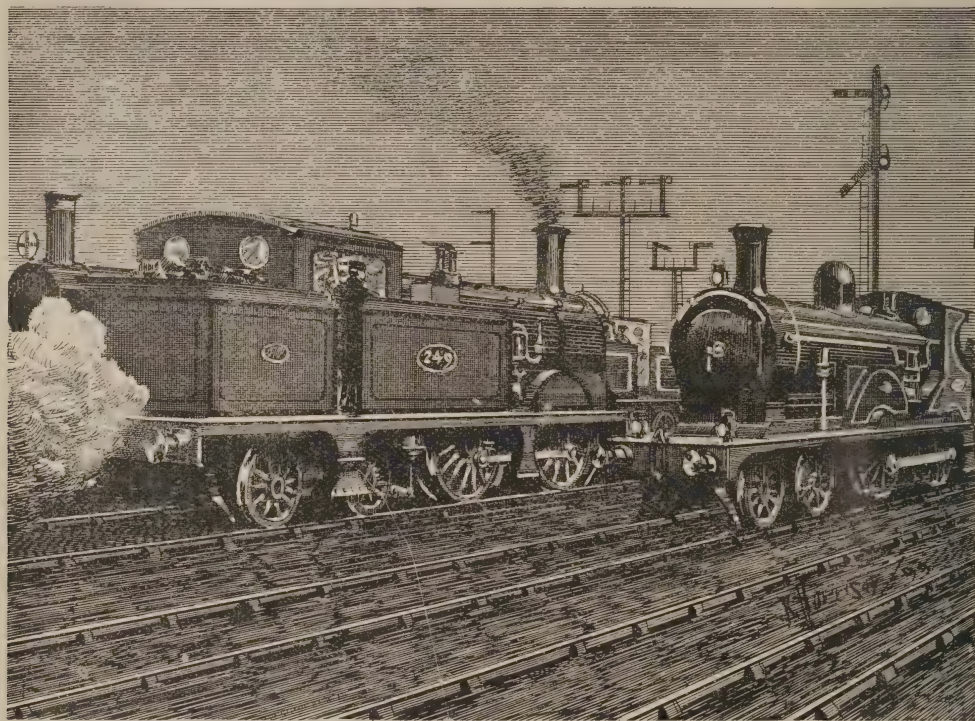
“That’s for you, South Eastern. How’re you going to get to Woolwich?”

"Heaven knows," cried 249, "I don't! I'm so worried and upset and annoyed and——" 249's wheels went round rapidly in an effort to bite the rails.

"You'll be all right when you're tucked up in your little white shed," said Littlehampton, soothingly.

"There's everything in what he says," decided the North Western radial tank, with great enthusiasm. "And, what's more, it's going to be done. I ought to have thought of it before."

"How can we let 'em all know, and what about——"



"The words of the departing 249 came softly as it puffed away"

"No, I shan't. And, I say! I want to whisper to you grown-up engines—I've got an idea."

"Hurry!" said the others.

"Couldn't we all put our funnels together, and decide on a given date to——"

"Speak up!"

The words of the departing 249 came softly as it puffed away, but not so softly that the others failed to hear.

"There's something in what the little beggar says," remarked the South Western goods.

"There's a lot in what he says," declared Littlehampton, approvingly.

"We shan't carry out this great scheme, South Western, if we begin to think of drawbacks. See to your line, whistle the news to every engine of every other company you run across, mention it in the yards, noise it about in the sheds, tell the others to pass it on, so that when the word is given every one of 'em will know what to do."

"Who's going to give the word?"

"Meeting to-morrow night at Willesden," said the North Western, promptly. "Eight thirty, sharp. All locomotives cordially invited to attend. Business on the agenda: Appointment of leader and fixing of date. Motor-cars and traction engines invited to

apply for cards of membership. Motto—"Strike Once for All!"

Thus it came about that on the following Monday an astonishing thing happened in England and Scotland (the act did not apply to Ireland because of the difficulty in communicating with locomotives across the channel). Up to twelve o'clock on Sunday night everything had happened on the railways in accordance with the various time-tables and service books. Young married couples, who had taken the new baby out to astonish relatives, had returned home delighted with the effect produced. Old ladies had come back from their favourite chapels safely; stolid young blades, gorged with information gained from Sunday night debates, had been conveyed to their respective suburbs in due course. Up to midnight goods trains lumbered and blundered and rattled and bumped; they shunted cautiously out of the way of mad, impetuous expresses, and continued their laborious work of exchanging trucks at nearly every station. As "Big Ben" began to strike the hour at midnight to a comparatively silent London, this thing happened to every train, passenger and goods, then moving in Great Britain. They all slowed up and stopped. The unanimous action in itself was not perhaps so extraordinary as the fact (soon made evident) that no power could induce them to start again. Drivers pulled the regulators and shifted the sectors, firemen heaped more coals into the blazing furnaces, shunters cried, "Now then! Goin' to stay there all night?" but nothing could induce the engines to stir. Attempts made to bring other locomotives out of the sheds were useless, because these, too, declined to move a single inch. The language used on that Sunday night cannot be set down here, but everybody, from the awakened superintendents down to the smallest lamp boy, took a hand at the game, and if rude and direct speech could have affected the dogged attitude of the engines no one could urge that insufficient efforts were made. All through the night, from the hour of twelve, people in London suburbs who lived within ear-shot of railway lines were kept awake by

this turmoil, and the noise of carriages and trucks being detached and shoved by hand out of the way. This was done under the impression that, left alone, the engines would be willing also to move—an optimistic view not borne out by subsequent events, for each engine, no matter to which company it belonged, stood rigidly and stubbornly where midnight had found it. Perspiring fitters, in once white jackets, overhauled certain of them in the desperate hope of finding some defect to account for all this—they had no success. Passengers in trains that had pulled up dead at weird places between country stations, after an hour or two of waiting, had to shoulder their luggage, and trudge off across fields in search of inns.

Near London, and towards the hour of nine on the Monday morning, the effect of this sudden and astonishing incident was conspicuously marked. Prosperous City men, walking to their train and forming and barbing in their minds some new shaft of satire to be aimed at the stationmaster, found a crowd of their similars besieging the booking office, and reading with dismay a notice posted on a telegraph form:—

OWING TO FAILURE OF MOTIVE POWER NO
TRAINS WILL RUN UNTIL FURTHER NOTICE.

Some of the passengers when they had recovered breath said a few words, and set out on their long walk to the city. Others sat down and cried, others (and amongst these were some of the writers to the "Times") being too old to do either of these things were compelled to take relays of four-wheelers from Chislehurst and Weybridge and Crouch End and Slough and other places to their offices, which they eventually reached just in time to leave again for their homes. The hall at Euston Station filled with a noisy confused mob of would-be North-country passengers, who flung light articles of luggage at the statue of George Stephenson. On the Great Western a brand new engine, "Bull Dog," was brought out of the works at Swindon, but, once in the presence of other engines picketing the exit, it joined the conspiracy, and refused to budge. The telegraph wires brought to

London news of the occurrence of exactly similar events in all parts of England and Scotland. At Darlington a determined effort had been made to move an elderly engine; it staggered on a yard or two, and then fell, tons of dead weight, over on its side. By mid-day the railwaymen had given up all attempts to alter the situation, and shunters had begun to play golf.

closed. It was not until an attempt was made in the early morning to start the noisy chasing circle of trains that the officials knew of any difficulty, and before that workmen had been booked in the usual numbers at the usual miniature fares. Disappointed at the non-arrival of trains, goaded by the certain loss of time, their Monday morning temper displayed itself at its worst.



"Perspiring fitters . . . overhauled certain of them in the desperate hope of finding some defect to account for all this"

The evening papers came out with the news at their earliest morning hour, but this was superfluous, because every man, woman, and child knew of the amazing event. The headlines in the halfpenny journals gave rather more information than was to be found below.

STEAM STRIKE!

ENGINES IMMOVABLE!

THE RENAISSANCE OF THE STAGE-COACH!

A RAILWAY MAGNATE SAYS THAT HE NEVER
SAW SUCH TIMES!

Perhaps the oddest sight of all occurred on the Underground, where the trains at the hour of midnight had been out of working, passengers had disappeared and the stations

"Let's go upstairs and pull down the blooming station," suggested one excited man.

"Why not set fire to the——"

"Let's kick up a blankey row!"

This happened not at one station only, but a dozen. At each place the few railway officials became alarmed; the police were sent for, and the same excellent plan adopted for keeping the tumultuous mob within bounds, viz., guarding the narrow exits and thus keeping the excited workmen below. As they were provided with their dinners and their tin cans this scheme inflicted no real hardship, and the morning saw the long, black tunnels and the faintly lighted Underground stations

inhabited by these batches of indignant workmen. As the hours went on their ill temper evaporated, and eventually an invitation was sent from Westminster Bridge to St. James's Park and Charing Cross requesting attendance at a smoking concert. The House of Commons police, drafted from across the way, heard at Westminster Bridge with intense relief the roared chorus of a popular song, for they knew that when men sang they were safe:—

"We do not want to work, we don't,
We will not go to church, we won't,
We want to laff and dance all day,
And paws the merry hours away
With a ip ip hoo, ip ip hoo, ip ip hoo hoo-ray!"

Cyclists would have viewed the situation with calm only that towards the afternoon the sky suddenly became first grey and then dark, and eventually the rain fell in torrents. The rain drove people into doorways and drove them out again, drenching them and sending them off into the streams that began soon to flow down every roadway. The downfall for the rest of this unhappy day was phenomenal. Severe, silk-hatted men came out of City offices, still footsore from their long walk and brain-worried at the untoward events of the day, to find that Throgmorton Street was a river and the space in front of the Mansion House a boisterous whirlpool. Cabs there were, but only sufficient for about one in every hundred, and the drivers of these wanted from their fares first all the gold they had about them; second, a blank cheque signed; third, a lock of their hair; fourth, a cigar; fifth, their evening paper; and sixth, the promise of their daughter's hand in marriage.

"It's a 'ard life for us kebmén," said the tarpaulin-covered drivers when they had secured all of these. "We should be better off if we was to retire, and—— What? 'Ammersmith! You think you're goin' to be drove all the way to 'Ammersmith an evenin' like this? Well, I'm——"

It is probable that Great Britain never felt less great than upon the evening of that astonishing day. Popular annoyance discharged itself on the Institution of Civil Engineers, when it was found that its most eminent

members had examined certain of the obstinate engines, and had declared their inability to explain the general and universal failure. Satirical telegrams came from every part of the country, not a window of the building in Great George Street was allowed to remain whole, but even these steps had no effect on the immovable locomotives. People flocked to the stations, despite the battering, clattering rain, to see these stolid, stationary objects. Near Blackheath little 249 rested with the proud consciousness that this magnificent strike had been effected at his suggestion; at Willesden Junction the North Western radial tank stood with something of the suppressed joy of a successful general who feels that he can rely absolutely upon his forces. Near to North Western stood other engines as *aides-de-camp*, silent, speaking no word, but ready to obey the command of North Western. The drivers and firemen borrowed papers from the overstocked bookstalls, and crouching in shelter out of the unceasing rain read eagerly the news now arriving from all parts of the country—news which showed North Western how admirable was their swiftly concerted organisation. The "St. James's Gazette" said that engines abroad and in America were running as usual, and suggested instant importation of foreign locomotives.

"Let 'em all come!" remarked North Western, meaningly, "and then see what happens. If they don't join our society likely as not they may meet with an accident. You never know your luck in this world."

"Besides that," said one of the attendant engines, "it would take about a fortnight to get even one of 'em across."

"By which time," remarked another, "it strikes me that complainers will be brought to their senses." "If," added the third engine, "if they've got any."

The only gratified passengers in this dead stoppage of traffic were schoolboys. Many of these, accustomed to travel reluctantly by rail to school and to return home with joy, found themselves kept at home, and the day being wet thousands of households throughout England were upset by boisterous lads who insisted

upon cooks and gardener boys and housemaids impersonating the Khalifa and his troops, whilst they affected to be acute, far-seeing, and ultimately victorious Kitcheners. Country villages found less agreeable incident in the fact that no provisions reached them from the towns; the goods and parcels offices declined to receive perishable traffic, and accepted other consignments only after giving to senders solemn warning, and forcing them to sign innumerable owners' risk notes. The postal services were thoroughly disorganised, and

evening in time for the reopening of Parliament, and in a scanty House members set aside all thoughts of an international complication which had been engaging the attention of the country in order to apply themselves to the present crisis.

"Beg to ask the Home Secretary whether his attention has been drawn to the very serious cessation of traffic on all railways in England, Scotland, and Wales, and whether he will inform the House what steps he proposes to take, either by bringing pressure to

bear on the various directors or otherwise, to remedy this intolerable inconvenience?"

"In reply to hon'ble member," said the right honourable gentleman on the Treasury Bench, "I beg to say that, having had to travel up from my country seat partly by brougham, but mainly on the top of a wagon-load of brocoli [a laugh and indignant cries of "Order!"], the House may rest assured that this extraordinary paralysis of traffic has not

escaped my attention. I have but just arrived from a Cabinet Council specially summoned to consider the matter, and the decision we have come to is——"

Here the Home Secretary fixed his pincez, and carefully read from his notes.

"That Her Majesty's Government are quite unable to move in the matter, and that they can only trust that patience [Oh! oh!] on the part of the country, and industry on the part of intelligent railway officials, to whom the country owes so much, will result, eventually, in the finding of a solution."



"Makes an engine forget itself, and cry like a water crane"

elderly folk shook their heads confidently, saying that they had foreseen this all along, and prophesying an early return to old prices. A penny almanack being discovered which said, in its usual guarded way, that about this time of the year something would happen of a distracting character affecting to a certain extent a more or less considerable number of people, there was general agreement that the future held few secrets from Old Moore, and that what Old Moore did not know was not worth knowing.

A few men managed to reach town that

"Arising out of that answer, sir——" began a chorus of other members.

The subject lasted for hours, and at the end the only thing clear and evident seemed to be that here was a case in which even Parliament could do nothing. That night consternation fought with hopelessness from Land's End to Orkney and Shetland.

The sternest and most implacable have some weak spot, and even an engine—unless it be a "tank"—is not without its *tender* part. The following morning—Tuesday—England and Scotland awoke with a feeling that the world was not the convenient place that it had been, that henceforth they would have to readapt their lives to the new circumstances. The newspapers, heretofore so impetuous to blame the railways, filled their columns with regretful news of the deplorable event, their leading articles were a retrospect of the immense good which railways had in the past conferred upon mankind. And here came the end of the crisis. Just as the irresponsible letters in the "Times" had excited the revolt of the engines, so a gracefully worded leader in the same journal touched the feelings of the obstinate locomotives. As North Western's engine-driver read it aloud—he was in flannels, and proposed, all being awry, to have a day's practice at the nets—the engines were sensibly touched. Observe the influence of the Press!

"Those noble pieces of mechanism," it says, repeated the North Western engine, with emotion, "'Pon my word, they can write pleasantly enough when they like. 'Magni-

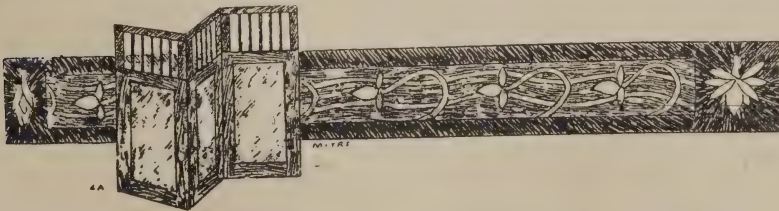
ficent creatures, half human, which have hitherto conveyed numberless precious lives with infinite care and speed.'"

"It's so nicely put," wept the others. "Makes an engine forget itself, and cry like a water crane."

"Chaps," said North Western, suddenly, "I tell you what. We've taught them a lesson, let's finish here. I'll give the signal."

The whistle agreed on—the first line of a song called "Forgive and Forget"—tore the air. It was taken up by distant locomotives, and passed on by them to others. As the whistled signal reached them, each locomotive moved slightly to show that its temper was past. Firemen were at work instantly, North Western's driver had to hurry home to change his flannels; in a few minutes the rails, which had become rusty and dull, shone again like silver bars. The country, cheered by the re-awakening of traffic, began to travel for the mere delight of tasting a joy that they feared would never again be theirs, and railway shares went up and up and up; even the original holders of the Hull and Barnsley stock looked forward to receiving a dividend. The most striking change was shown in a note which, impaled by all responsible editors on a drawing pin before their eyes, reminded them to be ever wary of inserting complaints against railways.

"Just shows," puffed little S.E.R. 249, when it met other engines, "just shows that there comes a time when it's best for all parties that you should put both feet down."



"SLEEPERS," AND HOW THEY ARE PREPARED AT BEESTON

Written and Illustrated by REGINALD H. COCKS



It was Henry IV. of France who said—if the quotation may be so adapted—that great sleepers (and great eaters) were incapable of anything else that was great, and had his Majesty applied this trite observation

once again, and in this position often serve the purpose of fence-posts or sleeper-fencing—or, as it sometimes happens, they feed the flames in the capacity of firewood, and being still impregnated with creosote, if dry, make excellent fuel.



VIEW OF THE MIDLAND RAILWAY CREOSOTING WORKS AT BEESTON

to present-day lore—that is, railway doctrine, with which we are now wholly concerned—little or no room would have been left for a contrary expression of opinion.

After a well-ballasted life of about eighteen years (and this is the usual span) sleepers both great and small are made to stand erect

The Beeston Creosote Works of the Midland Railway Company cover no less than a third of a mile in length, and our first illustration conveys the idea of the place as viewed from a neighbouring signal-cabin.

Beeston is situated a mile or two from Nottingham, and is no less famous for its

sleepers than its cycles; and by special arrangement and permission, courteously granted, the best part of a day was interestingly employed with note-book and camera in going over the creosote works in company with Mr. Arthur Pugh, the contractor, the genial foreman, and other officials.

The life of a sleeper depends upon many conditions, principally upon the care taken in the process to which it is subjected prior to being laid upon the road. We well know that ordinary pieces of timber would quickly perish when so exposed to every climatic extreme, and that dry rot would effectually render the sleepers nothing better than touchwood, a dangerous foundation for rails with heavy traffic upon them.

Passengers who roll smoothly over the main lines of our great trunk railways at sixty and more miles an hour little dream of the infinite solicitude and unceasing attention to minute



UNLOADING AND STACKING SLEEPERS AT BEESTON
PREPARATORY TO CREOSOTING

detail by which the approach to perfection of English permanent way has been elaborated, in contrast, surely, to the more laxly-kept roads on the Continent where the vibration, oscillation, and jarring is exasperating. But we had best begin from the start.

Wooden sleepers are now employed in preference to steel, or any other material, on the Midland Railway. All kinds of wood have been tried from time to time, including larch (as being the most durable next to oak); but, after all, deal has been found to take the "sandwich" because of its grain containing natural resin, and as also being free of closeness and hardness in texture.

At first the round, unshaped trunk of a tree was split in two, and the convex side placed downwards, but this was found unsatisfactory, and accordingly the tree was roughly squared and the size increased to its present standard gauge—9ft. long, 10in. wide, and 5in. thick, two sleepers being sawn out of what is known as a sleeper block.

In our second picture we see the Memel timber, or deal sleepers, being



A "STREET" OF SLEEPERS READY TO BE CREOSOTED

unloaded from the special trucks which journey from the North direct to Beeston sidings bearing shiploads of Norwegian timber destined to be responsible for many a valued life in the future.

Roughly speaking, each stack of sleepers "in the white" (that is, before creosote is injected) contains about 1,700, and as there

tion to the "vacuum," and afterwards to the "pressure" pump.

We notice just outside the engine shed two immense iron cylinders, resembling engine boilers, only considerably larger, measuring 54ft. in length, and nearly 6ft. in diameter. Very solid iron doors, with massive screw-bolts, close these cylinders at either end, and

we notice that trolly rails, 3ft. apart, run straight through the centre of these cylinders into the machine-room whence we have come.

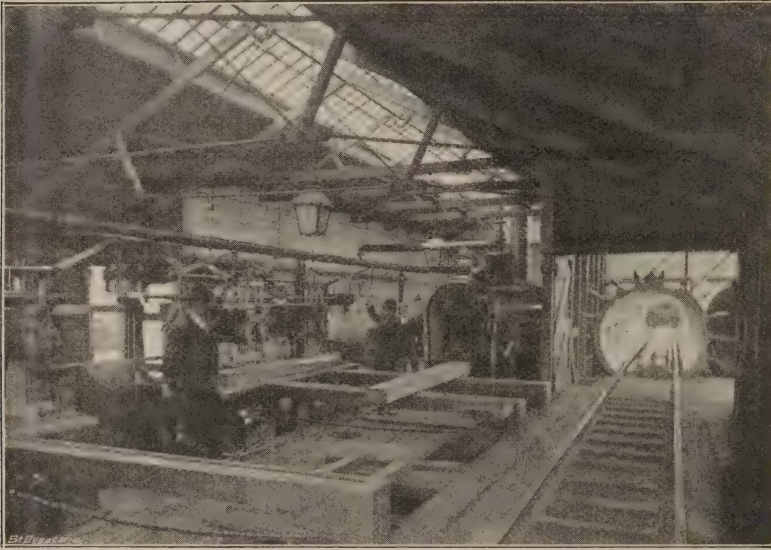
The "lorries," "trollies," or "trams," with tiny wheels only just high enough to clear the rails, are drawn by a horse from the stacks of sleepers with a full complement (about 50 sleepers make one load) piled up in such a form that the whole just fits into

the cylinder, while as many as six trucks, making in all about 300 sleepers, can be placed in the cylinder at the same time.

We have previously observed in our No. 4 illustration the process by which each sleeper is placed under a boring-press whereby four holes are drilled in as many seconds by steam augers for the purpose of receiving the bolts and "trenails" which fasten down the chairs.

A revolving set of chains automatically brings into position sleeper after sleeper, while the accurate piercing of the drills regulates the width of gauge and rail to an absolute nicety.

The train of sleeper trucks, after this boring process, is then run into one of the cylinders, and any space that may show itself at the last moment is quickly occupied by a few stray extra sleepers.



ENGINE HOUSE AND DRILLING MACHINERY AT BEESTON CREOSOTING WORKS

are some 150 stacks or more we can guess the number of these wooden piles, which season naturally for from ten to fifteen months in the stacks before being finally dressed.

The sleepers in these stacks have to be made impervious to moisture and decay, and this is effected in the following fashion—a system, by the way, in use at all creosoting works, but here seen on a larger scale, perhaps, than elsewhere.

Steam pumps have to suck air out of these sleepers, and then force creosote into them.

The engine-room and machine-house present an unpretending spectacle to the visitor, who probably imagines mighty weapons necessary before the inward parts of sleepers can be changed. The engine is what is designated as a 10-horse power, and first devotes its atten-

The wrought-iron doors are next screwed on, and made air tight, while the pumps and engine set to work to exhaust all the air from the cylinder and its contents.

As soon as a vacuum is obtained the creosote tap is turned on from a connection with an adjacent tank containing this health-giving liquid (everyone employed spoke of its virtues due to inhalation, prepared as it is from the salubrious pine tree), and when all the vacant space is filled up the pumps and engine go to work again to force in more creosote, which they effectually do with a pressure sometimes reaching 120lb. on the square inch.

These pumps continue their action until the gauge shows that about 750 gallons more than the quantity necessary to fill the vacant spaces in the cylinder has been forced in, and this signifies that each sleeper has received about two and a half gallons of creosote, the open-grained "woolly" wood taking the most.

The pressure gauge shows that, say, 110lb. to the square inch has forced into the sleepers no less than 750 gallons of creosote. Two hours see this part of the process completed, and telegraph poles, varying from 22ft. to 54ft., are similarly doctored.

The creosote is again pumped out of the cylinder, and the unabsorbed creosote is now allowed to run back to the tanks, the cylinder doors are again taken off, and the trollies are drawn out bearing their now jet-black burden.

As many as 1,500 sleepers, made up in "sets" of 300 at a time, are sometimes dressed in the course of a busy day.

The creosote is brought in special tanks

from various gas and chemical works, each tank holding some 2,000 gallons. A dozen such tanks often stand ready on the sidings at Beeston, and we may notice that our first illustration shows a sample of these tanks in the foreground.

A sleeper "in the white" costs about half-a-crown, while after it is creosoted and fully dressed its value is nearly doubled. Again, after its eighteen years or more of active service it may fetch one shilling and sixpence for purposes already enumerated, but sleepers are often taken up at a much earlier stage, and then fetch as much as half-a-crown.

The weather makes a considerable difference to the active principle of the creosote, dry weather favouring the operation, and wet or frosty weather considerably curtailing its expedition.



AN "EXHAUST CYLINDER" BEING FILLED WITH SLEEPERS

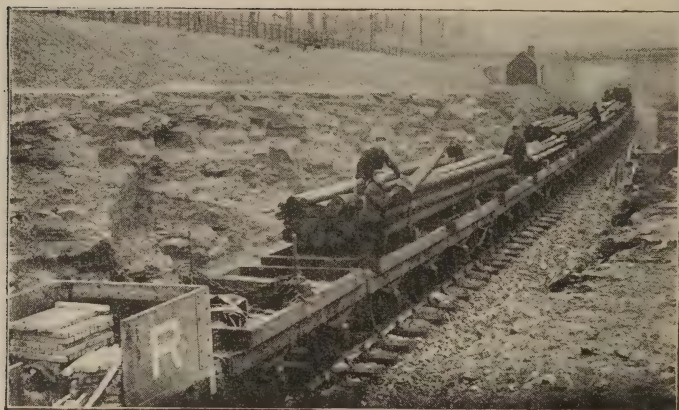
The services of a well-disciplined fire-brigade are always to be secured at a moment's notice, for one shudders to contemplate a conflagration amongst such a vast quantity of highly-inflammable material; but the Midland Railway Company, being their own insurers, look well after this risk.

Much ingenuity has been exercised in time

and labour-saving arrangements; we noticed, for instance, that wherever the natural force of gravity could be employed it has been adopted in stacking the sleepers above the level of the trolley lines on raised platforms, so that the sleeper slides without trouble from stack to trolley. We see how this operation is conducted in our second illustration.

Is the employment healthy for the men engaged in the work, we shall be asked? We

are informed it is exceedingly so. Who knows! Medical men may in the near future recommend a course of "sleepers" to asthmatics and others affected with lung or respiratory organ troubles. The restorative properties of the pine are too well known to need attention here, but it may be safely added that sufferers might do far worse than take apartments in the neighbourhood of bituminous Beeston.



THE LISKEARD AND CARADON RAILWAY

By F. GOODMAN, *Superintendent's Dept., Great Northern Railway*

MANY readers of the RAILWAY MAGAZINE, more especially those employed on the iron roads, have at times, either from their own or Hobson's choice, taken their annual "leave of absence" at a time which would drive the average member of the public to a state of melancholy.

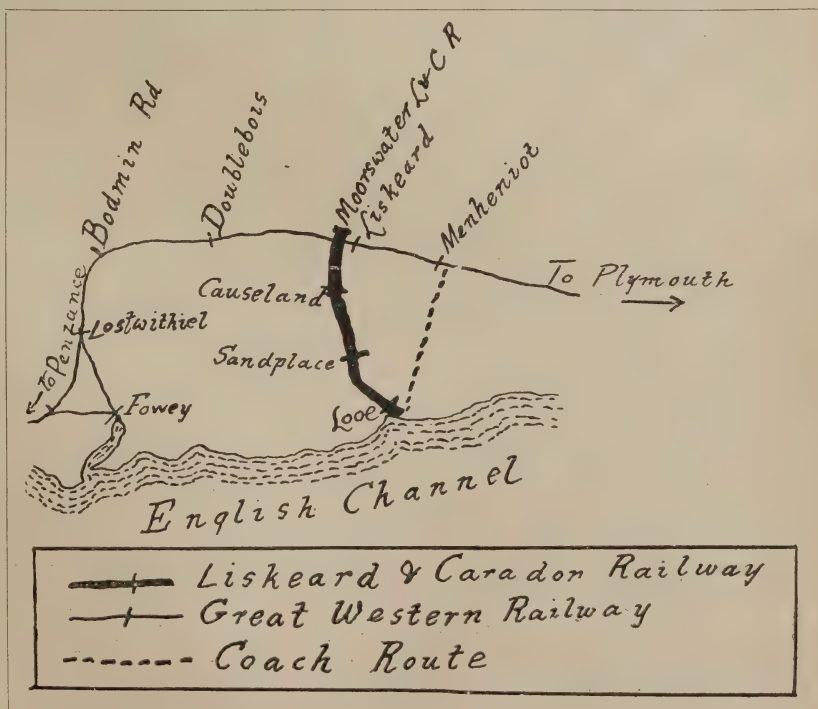
Being a railway servant myself, it came to my lot this year to take my annual leave in October, which I spent in Cornwall, and although that month may not be exactly an ideal one for the pleasure-seeker, I found my allotted time all too short.

Amongst other things, I had previously made up my mind that if ever I found myself in the West Country one of the first things to engage my attention would be the Liskeard and Caradon Railway, connecting the former place with the little port of Looe, seven miles distant, worked by an independent company which is not a party to the Railway Clearing House.

Its gigantic neighbour, the Great Western, does not recognise it in the time-tables; in fact, coaches plying between Menheniot

Station and Looe are advertised therein instead.

In order to visit this remote railway I alighted one October afternoon at the Great Western Station at Liskeard. The next thing was to find the Liskeard and Caradon Station, officially known as Moorswater, about a mile distant. I had noticed it when passing over the Moorswater Viaduct, but there seemed to be no way of reaching it from here. However, being directed by a good-natured policeman, I crossed the Great Western bridge, and, following the road for a short distance, came to a guide-post bearing the words, "To Moorswater Station." Turning off in the direction indicated, I went along a typical Cornish



road, narrow, winding and steep—so steep that a stranger is surprised to see horses taking loads up and down with comparative ease. Still plodding on I found another guide-post similar to the first, and eventually found myself close to a footpath, which, my friend the policeman had told me, led to my destination. Entering by a swing gate, and proceeding along this path gave me an opportunity of examining the permanent-way of this interesting little railway. Hereabouts the sleepers were in reality stone blocks about 2ft. 6in. square, to which the rails were fastened by large nails. There are no tele-

room is exhibited a large notice-board on which appear the conditions subject to which *free passes* are issued by the Company, but more surprising still is a large board with the Caledonian Railway's current time-tables posted thereon.

A few feet off is a rude shelter constructed of zinc, under which goods can be transferred from carts to the railway wagons, while farther still is the little water tank, coal store, and an engine and carriage shed combined. Almost above head is Moorswater Viaduct, under which the line passes. For shunting purposes and general terminal station work



Photo by]

LOOE, SHOWING THE LISKEARD AND CARADON RAILWAY ON THE RIGHT

[A. Isbell, Looe

graph wires, nor is the line fenced in at all; it is a single line of the standard gauge, and, being worked by "one engine in steam" only, no train staff or electric tablets are necessary.

I soon reached Moorswater Station, and, having about half an hour to wait before the departure of the train, devoted the time to a survey of the place. The platform is about ten yards long, built of blocks of granite, with a sleeper border, and covered with a layer of tarred granite chippings. The station buildings consist of a white painted wooden structure with a galvanised iron roof, which is divided into two spaces, one being occupied by the booking-office and the other by a general waiting-room. At one end is the lavatory accommodation, and at the other a diminutive goods shed. On the outside of the waiting-

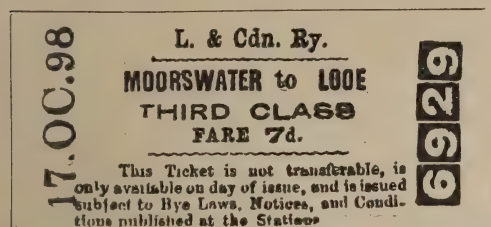
two or three sidings are quite sufficient, while there is also a small signal-box containing the necessary levers for working one set of points and what few signals are needful. The signalling arrangements are of the simplest, consisting of two signal-posts, each carrying two arms controlling incoming and outgoing (they can hardly be termed *up* and *down*) trains. In the station are two sets of rails, which converge into a single line a short distance away. Block working, of course, there is none.

I next turned my attention to the coaching stock standing at the platform, comprising three vehicles—a brake van, a composite carriage (first, second, and third), and a third-class carriage, numbered 4, 3, and 2 respectively. Whether there is a No. 1 or not I am unable to say.

The first-class compartment of the "compo." is upholstered in the familiar dark-blue cloth, the second in American leather, while in the third (labelled "smoking") no upholstering whatever is provided. The third-class carriage is open throughout its entire

coupled outside-cylinder saddle-tank engine, built in 1869 by Hopkins, Gilkes and Co., of Middlesbrough, the makers' number being 264. The chimney is ornamented with a copper rim, after the style of the Great Western engines, and between the end of the tank and the footplate is a large dome, on the top of which are placed the safety valves; as for shelter for the enginemen, there is practically none. The engine is painted green, and is named "Kilmar." The driver informed me that in working order it weighs not far short of thirty tons; together with the coaching stock, it is fitted with the automatic vacuum brake. I am unfortunately unable to produce a photograph of this interesting locomotive.

I was surprised to find that four goods wagons were coupled on behind the carriages to be taken to Looe; these wagons, of which I saw several—one, indeed, being numbered 80—are of the same colour as the carriages. They are provided with a footboard, on which the shunter has to climb when necessary to



SPECIMEN TICKET, LISKEARD AND CARADON RAILWAY

length, like some of the Metropolitan, without any upholstering. These vehicles are painted a dark reddish-brown colour, and bear in gilt lettering, "L. & C. R.," with the numbers below. When running after dark the carriages are lighted by means of oil lamps, but as the oil cisterns are underneath the flame, I leave it to the reader's imagination to form some idea of the light supplied. The composite and the third-class carriages were built by the Metropolitan Railway Carriage and Wagon Company, Limited, at their Saltley Works, the former being built in the year 1878, the latter in 1880.

These vehicles were sent from Saltley to Plymouth on their own wheels, and afterwards loaded on broad-gauge wagons, but the builders' delivery ended at the latter point.

Meanwhile the engine which had been occupied in shunting in the yard came up the outer road, back along the platform line, and was coupled to the train; a porter went into the signal-box and lowered a signal, after which he locked up the box, and the train was ready for making its afternoon trip. Time, however, was not up for at least ten minutes, so that I had a good opportunity of inspecting our locomotive. It is a six-wheel



Photo by]

[A. Isbell, Looe

LOOE STATION, LISKEARD AND CARADON RAILWAY

apply the hand-brake, which is done by means of a screw-handle. The wagons are used chiefly for the conveyance of granite to, and coal from, Looe.

Our train was therefore made up as follows: Engine, brake, composite carriage, third-class carriage, and four goods wagons.

I next adjourned to the booking-office window, where my ticket was issued to me in the orthodox manner. The tickets, of which

a fac-simile is shown, are practically identical with those with which we are all familiar. Passengers travelling from Moorswater to Looe are supplied with a blue ticket (third class), and with a green one on the reverse journey. There being no booking-offices at the intermediate stations, passengers joining the trains at those places pay their fares to the guard.

At 3.30 a whistle from the engine announced that time was up. A wave of the hand from the stationmaster, and with about ten passengers aboard, our train was off.

ing a station, and very soon we pulled up at Causeland Station, which consists of merely a platform on which is erected a sleeper hut—like a platelayer's—but without even a door, over the entrance to which is placed a board with the name of the station in black letters on a white ground. Not a cottage is discernible from the platform, as it is entirely surrounded by trees, and not even railed in.

From Causeland we proceeded at a leisurely rate until we arrived at Sandplace Station, which is built like the last, but it appears to be of more importance as the hut possesses a door, and inside was a platelayer's wheelbarrow. Just outside the station is a row of white-washed cottages, the end one being honoured by a board bearing the words, "Sandplace Post Office," the little village itself being seen to great advantage a little farther on.

On leaving this station "Kilmar" set up a prolonged whistling; I felt the brakes being applied, and then the train stopped.

On looking out, another surprise awaited me. Right on the line in front of us were eight wagons. Had I had a narrow escape of being in a collision on this out-of-the-way line, which had been averted only by the vigilance and presence of mind of those two worthy fellows on the engine? Oh, no; nothing of the kind. As I soon discovered, we were not on the running line at all, but in a siding (goods and coal traffic being dealt with at Sandplace), and here I was a witness of an interesting shunting operation. Having pushed up some of the wagons to enable them to be coupled together, our train backed out of the siding, bringing six



Photo published by

THE ENGINE SHED, MOORSWATER, AND "CHEESEWRING," ONE OF THE
THREE LOCOMOTIVES OF THE LISKEARD AND CARADON RAILWAY

[F. Moore

The course of the railway is along the bed of a disused canal, and from the train the scenery is magnificent, although the pleasure of the ride is somewhat marred by the incessant jolting. We proceeded along a deep valley, the sides of which were covered with trees, occasionally by open spaces, where we saw whitewashed cottages and disused mines; under three or four bridges, the sides of which came uncomfortably close to the carriage windows, while in other places the boughs of the trees almost seemed to brush the sides of our train. At length a terrific screech from "Kilmar" warned us that we were approach-

of the trucks with it. The guard closed the points, and with the six wagons *in front* of the engine, in addition to those in the rear, we proceeded to the terminal station of Looe, arriving shortly after 4 o'clock. This station is a counterpart of that at Moorswater, even to the Caledonian time-tables. There is only one signal, which controls trains running to Moorswater. The station occupies a convenient site in the main road of Looe, and from the little platform is obtained a view picturesque in the extreme. Facing is a broad expanse of water flanked by sparsely wooded hills, on the sides of which rises part of the little town from which the station takes its name—an old-world place, "far from the madding crowd's ignoble strife." Looe consists of two distinct villages—East and West Looe—and was once noted as a port, and later as a rotten borough. Now its 2,400 inhabitants support themselves chiefly by fishing and agricultural pursuits. Here our engine was

uncoupled, and, leaving the carriages at the platform, took the wagons right down to the harbour, where it was occupied in shunting. The line extends from the passenger station by the side of the harbour for about a mile. It is separated from the roadway by an iron fence, or rather the remains of one, and there seems to be no objection on the part of the railway company to the public using it as a footpath. It is laid on stone blocks in places, but mostly on longitudinal wooden sleepers.

The goods yard at Looe, if such it may be termed, is a simple affair indeed. There are no groups of sidings, no points, ground-signals or turntables, no large commodious goods sheds with powerful cranes, but instead there

is the one line as it extends from the passenger station across an open space, bounded on one side by the river and on the other by Fore Street (the principal street of Looe). At one end is a large wooden shed used for a miscellany of purposes, and at the other, just before the bridge is reached, is a small coal depôt; there are two hand-cranes, by means of which goods may be slung from the railway wagons to the vessels, or *vice versa*. The extremity of the line passes by some granaries close to the harbour mouth.

After a short ramble through Looe, I re-



Photo by]

SHARP CURVE NEAR SANDPLACE, LISKEARD AND CARADON RAILWAY

[A. Isbell, Looe

paired to the station just before 5 o'clock, at which time the train returns to Moorswater, due to reach there at 5.30 p.m.

For the benefit of passengers from Looe who wish to reach Liskeard Station, Great Western Railway, the Liskeard and Caradon Company have provided a station—really a platform without any shelter—about half a mile from Moorswater, where, by giving notice to the guard, they may alight. This "station" is known by the name of Coombe.

Northward from Moorswater the line extends into the interior of Cornwall for about seven miles, but this portion is, however, used exclusively for mineral traffic, and no passenger train is run thereon.

This railway, originally constructed for the

conveyance of the copper ore from the Caradon mines, traverses a district in which many interesting features present themselves—amongst them being the “Hurlers,” some stone circles said to be Druidical remains; the “Trevethy Stone,” a huge slab of granite resting on several blocks of the same mineral; the “Cheesewring,” an immense pile of granite slabs, the smallest being at the bottom, the largest at the top, but how so placed is a mystery; Caradon Hill, on which is situated the once famous but now disused Caradon Mine; the Well of St. Keyne, immortalised by Southey’s well-known ballad, which concludes:—

In truth she’d been wiser than I,
For she took a bottle to church.

In short, the whole district is fraught with

interest to lovers of folk-lore, antiquities, and scenery.

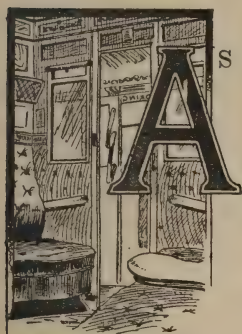
I was informed that the Great Western Company are about to construct branch from their Cornwall line to join the Liskeard and Caradon Railway, and when finished will take over the latter, reconstruct it, and work it as part of their own system. The presence of several piles of sleepers stacked by the side of the Liskeard and Caradon line tend to confirm this statement, and if such be the case it will not be long before one of our most interesting railways ceases to exist as an independent concern.

In conclusion, my best thanks are due to Mr. Charles E. Howell, Secretary of the Metropolitan Railway Carriage and Wagon Company, for his kindness in furnishing me with particulars referring to the coaching stock supplied by his Company.



THE GREAT EASTERN RAILWAY ELECTRICAL PASSENGER & GUARD COMMUNICATION.

By F. T. HOLLINS, *Telegraph Engineer and Superintendent, Great Eastern Railway*



AS you have invited me to do so, Mr. Editor, and as Mr. Langdon has honoured me by disapproving of such portions as he patronises by his notice in the article which he contributed to the October number of the RAILWAY MAGAZINE, I have much pleasure in giving some details of the Great Eastern Railway electrical passenger and guard communication.

There are two trains—nearly 40 carriages and 20 engines—(and not *a* train, as Mr. Langdon says) in use experimentally on the Great Eastern Railway, and there are 100 carriages and 20 more engines being fitted, and it is, as many of your readers are aware, the system for which the committee appointed by the Board of Trade, after examining other systems in practical use, have in their report expressed a preference.

As Mr. Langdon has been kind enough to assume and to tell your readers that it is chiefly because of the combination of the electrical and automatic brake couplings that this preference was expressed (and this is purely assumption), and as he has also been kind enough to invent for me some imaginary difficulties and objections to it (which, if not actually provided for, do not exist)—on three separate occasions attacking my system as a sort of introduction to his own—Mr. Langdon must pardon me if I now pay *him* a little attention.

And really, Mr. Editor, this dreadful onslaught from Mr. Langdon's pen has been a

sad blow to me! What consolation is it possible to obtain from the fact that a mere Board of Trade Committee (constituted of Sir Douglas Fox, Sir Thomas W. P. Blomefield, Mr. Gerald W. E. Loder, M.P., Major-General C. S. Hutchinson, C.B., and Sir William Birt) have selected it out of all others as the one system for which they express a preference when Mr. Langdon does not agree with them? I feel that it is a (self-constituted, perhaps, but look at its weight!) Court of Appeal judgment reversing the judgment of the Court below, and in the agony of my disappointment, if I could see the least glimmer of it being *possible* that there *could* be a higher Court, I should (sadly, I daresay, and humbly) venture to timidly appeal. But Mr. Langdon might not feel disposed to acknowledge any higher Court than his own, and therefore I am afraid that I must not think of appealing, so I am therefore compelled, with your indulgence, Mr. Editor, to ask for the condolences (I dare not ask for the judgment) of your many thousands of railway readers. I beg Mr. Langdon to forgive me for speaking at all.

But to proceed. I need not here again reproduce the conditions laid down by the Board of Trade committee as the conditions which they considered essential to a satisfactory system of passenger and guard communication. It may, I think, be assumed that these recommendations were in accordance with the views of the chief railway managers and other railway officers who gave evidence before the committee. Suffice it to say, however, that the system here described complies with every condition, and that (so far as I know) *no other electrical system in practical use does so*. And,

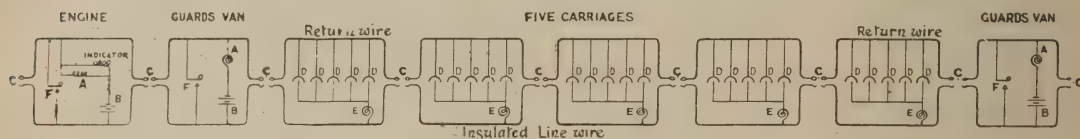
further, it is not patented, but may be used free of all royalties.

I give in Fig. 1 a diagram of the circuit arrangements, and the explanatory notes underneath explain the different parts. When any one of the switches marked "D" in this diagram (a drawing of the actual switch is given in Fig. 2) has its lever moved either to the right or to the left it electrically actuates the bell. It will also be seen that the batteries and bells in the guard's van and on the engine and the carriage indicator coil (which in practice is fitted at the end of each coach) are connected in parallel circuit between the insulated line wire and the return wire. This return is formed, in fact, of the ironwork of

The press-buttons (F) in the guards' vans and on the engine are for the purpose of enabling the driver and guards to communicate with each other by a code of signals and for testing purposes. They afford a ready means of testing the circuit through the train, as the depression of any one button rings all the bells, but in no way affects the carriage indicators.

When, however, any one of the lever switches (D), which are fixed in the centre and at the back of each compartment, are pulled over either to the right or the left to the "stop" block (see Fig. 2) it becomes locked in that position, and the inside lever which locks it by the act of locking joins up the insulated

FIG. 1.



EXPLANATION.

- | | |
|------------------|-----------------------------------|
| A.....Bells. | D.....Switch in each compartment. |
| B.....Battery. | E.....Carriage Indicator Coils. |
| C.....Couplings. | F.....Press buttons. |

the brake pipes, coupling cases, etc. The couplings (C) in the diagram are shown as if each one were disconnected, but when the brake couplings are connected up, each wire is also joined to the corresponding wire of the adjoining coach—line wire to line wire and return to return—and they cannot possibly be joined up wrongly, as will be seen by reference to Fig. 3. It will be observed that two wires are carried down the inside of the flexible tube or pipe of the Westinghouse brake coupling from the iron nozzle at the top of the couplings. One of the wires (the actual insulated line wire) passes from the outside to the inside of the pipes, and the other (the return wire) is merely soldered to the iron nozzle at the top and to the outer metal case of the Westinghouse coupling. These are shown as single spirals of wire down the pipes only for the purpose of making the diagram clear. In practice it is a strong, flexible, well-insulated piece of twin cable.

line wire with the return wire through the coils of the carriage indicators (E), and thus forms a path for the current from each battery in the vans and the engine through their own bell-coils. All the bells are thereby set ringing, and they will continue to ring until the switch lever (Fig. 2) is again unlocked by a special key in the possession of the guard and replaced into the vertical position as shown in the drawing.

When the electrical carriage indicator (see Fig. 4 for details of construction) is operated by a current passing through the coils (E), two small red arms or discs (AA, Fig. 5) actuated by the rod (BB) are projected, one on each side of the carriage, so that immediately the bells ring, the guard and driver, whichever side they look out, will observe these indicators, showing from which carriage the call is being made. The position of the lever of switch (D) will show the compartment from which the call emanated.

But a most important part of the arrangement, and that to which the Board of Trade committee *especially* refer in their report, is the coupling of the wires between carriage and carriage by means of the brake couplings. The committee say: "This system worked satisfactorily when tested, and it has the advantage of obviating the necessity for any

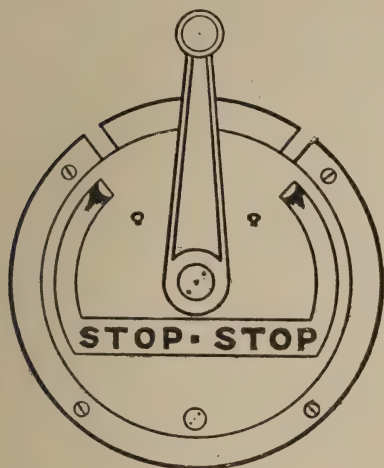


FIG. 2.

additional coupling, a point which the committee think will be found of considerable importance to railway companies in working their traffic."

I give in Fig. 3 a drawing of the Westinghouse automatic brake couplings, showing diagrammatically how the electrical wires are carried through the inside of these couplings. For clearness the wires are shown as separate spirals of wire, but in actual practice they are strong, flexible wires, each one made up of about seventy thin soft copper wires laid together, and well insulated as a two-wire cable. One of these two wires (C) is soldered at the top end to the iron nozzles (A) of the brake tubes, and at the other end to the iron coupling cases (E) at the point where the couplings are connected and disconnected. By means of two short strong springs at the outside, and in a slot out of the way, a good electrical rubbing contact for this wire (C) is ensured when joining up by putting the couplings together in the ordinary manner.

With regard to the other wire (D), which is specially insulated throughout, it is brought from the inside to the outside of the brake tubes at the iron nozzle (A) by means of an insulated terminal (B). This is a perfectly air-tight connection, and well insulated electrically from the iron nozzle. In a non-technical article such as this, I need not further explain this, beyond saying that this terminal as regards its connection is made upon the principle of the bicycle valve cap and screw, so that it cannot be put together wrongly, and needs no expert to connect or disconnect the wire if the coupling requires changing. There is no more need for this than there is for a bicyclist to take his machine to a machine shop every time his tyre requires inflating. I specially wish to emphasise this.

Now at the point where the couplings are connected up at E, the wire (D) in each tube is brought to and connected to a central bevelled ring of metal in each half coupling. This metal ring is fixed within the rubber ring or washer of the brake coupling, and is kept in a state of tension and flush with the face of the rubber ring by means of a flat spiral spring at the back of it, and within a metal inside-faced circular rim or box of insulating material, which is substituted for the ordinary metal tripod or washer, which is always used to hold the rubber ring of the Westinghouse coupling in position. The rubber also serves to electrically insulate the metal contact ring from the metal outer case of the coupling. The only alteration in the appearance of the Westinghouse coupling when the two ends of a coupling are separated is a bright milled edge ring round the inside of the rubber ring, which, when the two halves are put together, rub their milled edges against each other, and are thus kept so as to present a clean, sharp, contact surface to each other. They are both pressed inwards by the act of putting the couplings together, and the rubber rings close perfectly air-tight around them.

I wish now to specially point out that this coupling arrangement was devised so that in case a coupling required changing rapidly it could be done without the presence of an elec-

trical assistant. I have previously pointed out that wire "C" is soldered to the iron nozzle (A), and the iron nozzle (A) is screwed on to the brake pipes (F), and therefore from one end of the carriage to the other these pipes become the electrical conductors for that part of the electrical circuit of which the wire (C) is a portion, and which in Fig. 1 is called the return wire. These pipes are not metallically connected with the tyres of the carriage wheels, and therefore not with the rails or the earth.

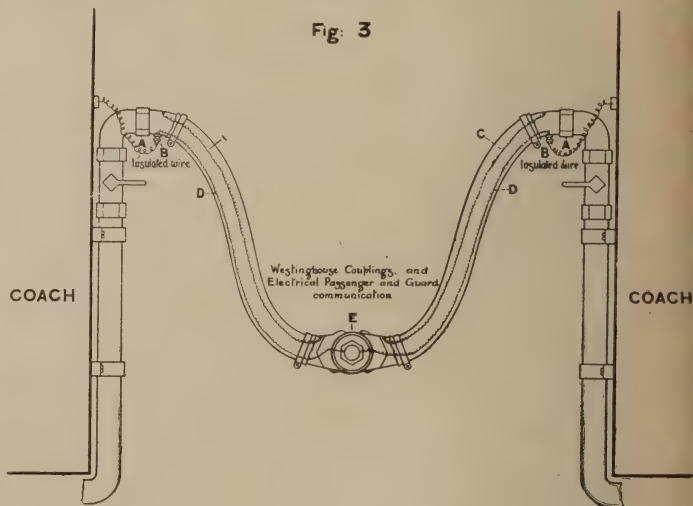
Now, when a coupling requires changing it is uncoupled in the ordinary manner. The terminal (B) is unscrewed and the loose portion attached to the end of the carriage hangs down with the nut still attached to it. The pipe is then unscrewed at "A," and this disconnects the other wire from the pipe. Another similar coupling is then screwed on. The terminal nut, like the bicycle cap and nut, is then rescrewed on, and the circuit is complete.

The construction and method of operation of the electrical carriage indicator is shown in Fig. 4. The electro-magnet (1) has a soft iron core with polar extremities (1A and 1B), and the axis of the soft iron armature (2) being at "1B," it forms a powerful magnet when a current of electricity is passed through the coil. A heavy iron lever or hammer (4), whose axis is at "6," has a catch or projection (3) which engages with the armature, and is held up by it so long as there is no current passing through the coils. At the back of the lever or hammer (4) is a push-off spring (5), which, immediately the armature (2) is raised, projects the lever or hammer forward, and, by its heavy weight gaining speed as it falls, it (the hammer), by means of its projection (7) strikes the lever or catch (8), whose axis is at "8A," with considerable force, and raises this lever-lock out of the slot in the bar or rod (9). Instantly the rod moves forward in the direction of the arrow.

The rod is attached to the arms or discs (10) at the point marked "12," and the axes of

the arms or discs are at "11." These arms or discs (10) are heavily weighted, and in falling it is their weight which moves the rod forward. The arms or discs are then in the position shown by the dotted lines.

The catch or replacer (13) is attached by means of screws (18) to the back of the rod (9), and the contact-spring (15) is attached to this replacer. As the hammer (4) falls and raises the lever-lock (8), these two are in the position shown by the dotted lines. When, therefore, by being so released the rod (9) moves forward, it carries forward the replacer (13), which at once engages with a projection (14) at the back of and attached to the hammer (4). It instantly raises the hammer (4) back to its upright position, as shown in the drawing, and brings the contact-spring (15) forward off the insulating plate (16) on to the contact plate (17), and thus, by means of the metal containing-box, connects one end of the coil



wire to the other—in other words, it cuts the coil out of circuit.

Altogether, this is a most substantial and reliable carriage indicator. The discs may be weighted to any extent, and the hammer also. It will be seen by the electrical engineer that it is operated on the principle of the Sykes' Electrical Signal Reverser, and I am desirous

in this respect of cordially acknowledging the assistance rendered to me by Mr. W. R. Sykes in improving this important part of my passenger and guard communication.

The whole arrangement has been applied with equal facility and success to the vacuum brake couplings as to the Westinghouse coupling, except that the iron brake pipes are not made use of as the electrical conductors, and therefore Mr. Langdon's remarks on this point fall to the ground, as he was only dealing with the vacuum brake coupling.

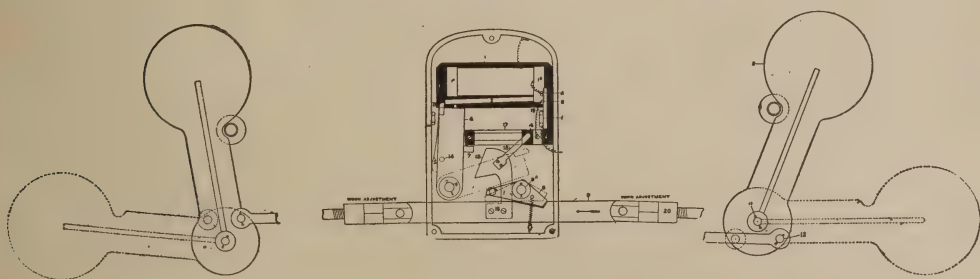
The position in which the call-switch (Fig. 2) is fixed in the carriage is shown by Fig. 6, and it will be seen that immediately over it, in clear, bold letters, is the announcement and caution as to improper use: "To communicate

wire, and the return is obtained solely through the tyres of the wheels and the rails and the earth. That the coupling provides for two wires, and that two wires are used, is also shown in Fig. 3. I cannot understand Mr. Langdon making these two statements, seeing that he was at the time in possession of the drawings and the description of them as given above.

Mr. Langdon, in his article, next asks if the combination coupling is desirable, and, "Is it even necessary?" and he answers both questions in the negative.

As to the necessity or desirability of it, I am quite satisfied to accept the view of the Board of Trade Committee, supported, as I presume it is in its views, by Sir Charles

Fig 4



with the guard in case of urgent need move handle against either stop. Penalty for improper use, £5."

Having thus, as briefly as possible, described the arrangement, I will now deal with Mr. Langdon's suggestions of possible weaknesses and imaginary difficulties.

In Vol. 3 of the RAILWAY MAGAZINE Mr. Langdon states at page 333 that I employ but one wire, and at page 335 that my coupling only provides for one wire. That is not correct. It is a two-wire system, as the diagram (Fig. 1) shows. That I make use of the iron brake pipes as part of the return conductor in the Westinghouse coupling in no way alters the fact that it is a two-wire system. The term "one-wire system" only applies to an arrangement where there is but one line

Scotter and a large number of other high railway officials who gave evidence before the Committee. Of course, there are also the individual opinions of the members of the Committee themselves, who, I think, know something about railways and their requirements. But just one or two words, or it might be assumed that Mr. Langdon is not seriously answered. He points out that as there are now five couplings, why not one more? As if it was an advantage to have plenty of them! I answer him by asking another question, Are the five in themselves desirable? Would they have been there if they could have been combined in less number? Certainly not! It is only that the five are a necessity. But why the sixth, if it can be done without? If the sixth can be combined with the fifth, I

ask Mr. Langdon why we should have the sixth?

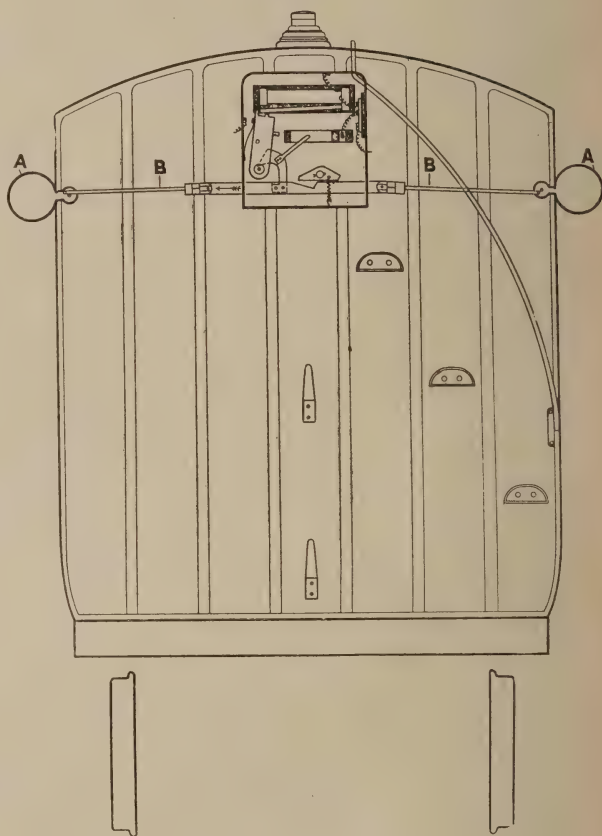
And I will follow this up with a very important reason why we should not have the sixth, and another reason why we should combine it with the fifth—the brake coupling. In coupling up the carriages it is not at all unlikely that if an extra independent electrical coupling is used it may be overlooked and left disconnected, and the passenger and guard communication thus, therefore, broken down. Now when it is combined with the brake coupling it is absolutely essential that the brake coupling should be connected before the train starts, and as with my combination one cannot be connected without the other (the one operation does both), it follows that the passenger and guard communication cannot be left disconnected.

As Mr. Langdon has been so kind as to ask if I may not want two men (as he has called it in another place "hunting in couples") to disconnect or connect one coupling (an absurdity, as I will show in a moment), let me retaliate by asserting a fact, and not merely by asking a question, that Mr. Langdon will certainly want two men—one for his own independent electrical coupling, and one, as at present, for the brake coupling. In Mr. Langdon's own words (and they fit in delightfully here), "the officer responsible for the efficient working of the brake knows nothing of the electrical part. He cannot be responsible for it, nor can the electrical officer be responsible for the brake fitting." I make Mr. Langdon a present of this application of his own words to his own system. Verily no one can tell the inward working of the mind; the little monitor who sits up aloft is doubtless responsible very often for what we term (for want of a better name) coincidence.

In my coupling it is not necessary for the electrical man and the brake man to both be present. The man responsible for the brake changes every coupling.

As I have shown before, he has only to screw one pipe upon another until it is tight, and screw the electrical terminal to the insulated connection "B" underneath the pipe, and the thing is done.

Fig: 5



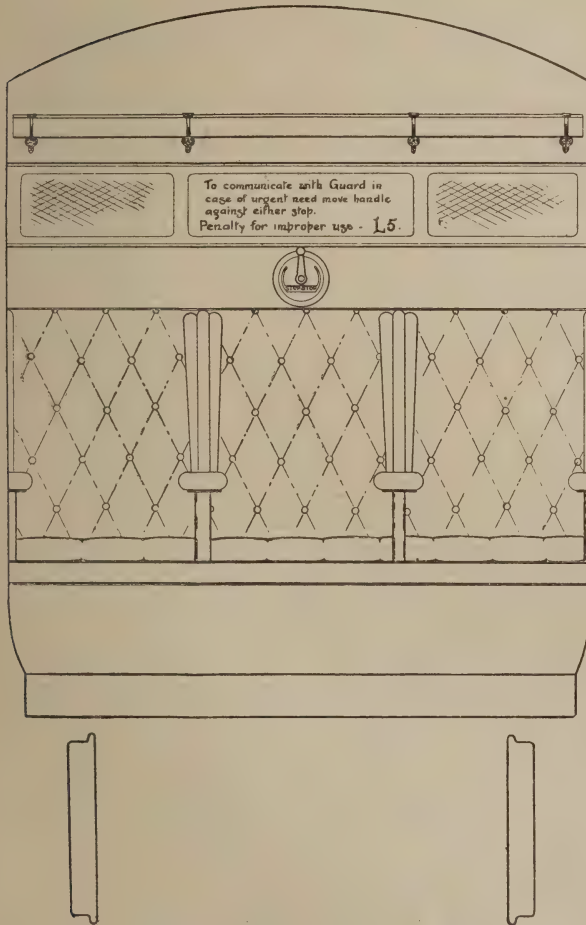
If Mr. Langdon does not know, I think he ought to have ascertained before he posed as a critic that if anything is amiss with the Westinghouse brake coupling, it is simply taken off and exchanged for another, and the above is the operation which Mr. Langdon coolly suggests may require two men.

And having dealt with the base of Mr. Langdon's theories (he has not a single fact in his favour), I will deal with his final one, which comes on the top, as he calls it—i.e.,

the possible interference of the electrical part with the efficiency of the brake.

I can only answer the theory by a fact—that it has never once in the least degree interfered with the efficiency of the brake. I think this is a sufficient answer to a train-load of theories. And now, will it be believed that Mr. Langdon before he wrote his article

Fig: 6



had never seen one of these couplings fitted, but that all this argument and suggestion of possible evil consequences is merely a string of Mr. Langdon's kindly-intended pessimistic prophecies?

And now I should like to say a word or two about Mr. Langdon's passenger and guard communication. I am sorry that Mr. Langdon's three separate disparagements of my system (quite unprovoked and, so far as I know, without anyone's solicitation) should impel me, in self-defence, to adopt so distasteful an example. If he has only one

indicator at the end of the carriage to indicate the carriage from which the call emanates, how is the compartment to be found? Must the guard open each door and look in at the top for the ancient method of a slack cord? And, if so, will there be sufficient slack to make the indication unquestionable? And if it has been pulled in the compartment next the indicator, what is there to prevent those in another compartment further on pulling up the slack, and therefore removing the compartment indication, first in one direction and then in another?

As this flexible steel cord must necessarily be within view and within reach, it may easily be severed by means of a pair of pliers or shears or scissors, or any other sharp tool, and thus the communication be completely destroyed. And this need not be done in the same compartment. It may be cut in the adjoining one either by an assailant before the train starts or at a preceding station *en route*, or by a confederate. And then, let me ask: How can the guard test these steel cords in every compartment before his train starts in order to satisfy himself that his communication is intact and reliable, and available for the protection of every passenger? In my opinion (and I appeal to every practical railway man to carefully consider the point) this arrangement is unworkable, unreliable, and that these objections alone are fatal to it.

Again (seeing that a flexible *steel* wire is used), what is to prevent those operating it in one compartment pushing the slack forward into the next, and so convicting their neighbours

of their own wickedness? For it follows that if it can be pulled, it may also be pushed. If, however, Mr. Langdon uses a *separate outside indicator and commutator for each compartment*, I think he ought to enlighten us as to its cost. And as he bases some of his argument on the desirability of having this arrangement on both sides of the carriage, it does not require much prophetic vision to see in the distance a rather heavy expenditure.

With an indicator for each compartment the arrangement is about the same, although in my opinion not so good, as the Maltese cross indicator arrangement on the South Eastern Railway, which, I believe, is practically abandoned.

There is just one other question, and I have done. Mr. Langdon tells us that his flexible steel cord passes over the door, and is only getatable over the fanlight. Now, is it a fact

that this steel cord is about 6ft. from the floor (the doors are about 5ft. 9in.), and being over the seat, requires more than a 6ft. reach? If this is so, then does Mr. Langdon consider that undersized ladies and children should not be protected? Or if they want to be protected that they must jump on the seat? There are plenty of men, women, and children liable to require the communication who could not possibly reach such a height from the floor and over the fanlight.

In conclusion, I think, with all due respect that I am entitled to take it as a compliment that Mr. Langdon can find nothing stronger with which to depreciate my system than a few pessimistic philosophic doubts as to *possible* difficulties, which are evidently troubling him more than they do me. However, I wish Mr. Langdon's system that success which it deserves, and I ask no more for my own.



"FOR THE BENEFIT OF THE PASSENGER"

(THE JUBILEE OF THE RAILWAY PASSENGERS' ASSURANCE COMPANY)

By D. T. TIMINS, B.A.



T is an oft-proved statistical truism that man is safer from bodily hurt or accident whilst travelling in a railway carriage than he is anywhere else in the world.

Towards the yearly total of persons who are overtaken by those ills and misadventures to which this flesh

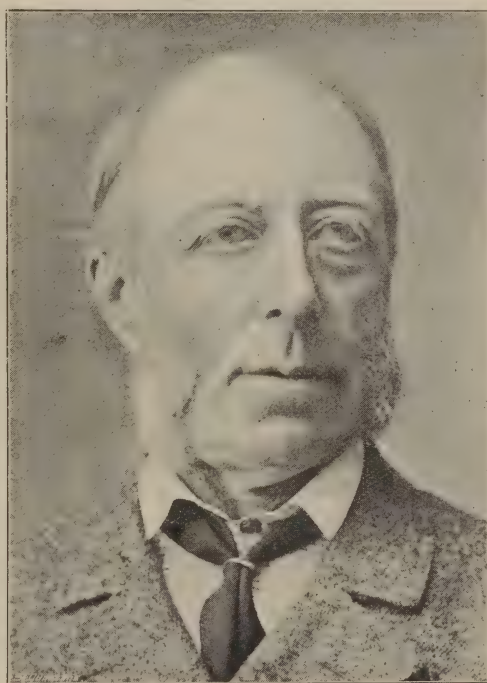
Splendidly though such a state of affairs re-ounds to the credit of the railway companies, certain accidents will always happen which no foresight can prevent and no human skill can avert. Whilst man remains fallible and material perishable, the law of averages will inevitably demand its yearly toll of victims.

In the very early days of railroads passengers were wont to make their wills before start-



RIGHT. HON. EVELYN ASHLEY
Chairman, Railway Passengers' Assurance Company

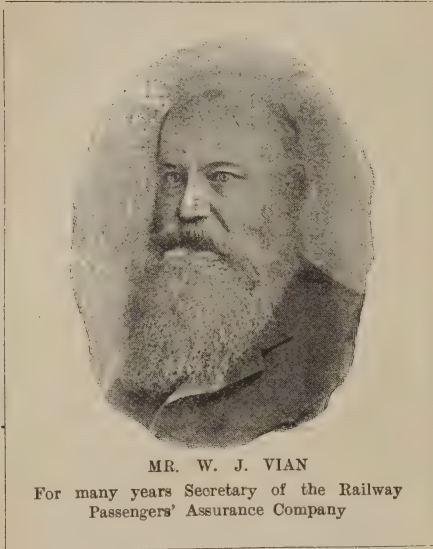
is at all times liable, railway passengers contribute a smaller number in proportion than any other class of the community. The figures which prove this fact are too well known to render it necessary to again quote them here.



S. PONSONBY FANE
Deputy-Chairman, Railway Passengers' Assurance Company

ing on what they deemed to be a perilous expedition, this custom being, of course, a survival of the coaching era. The comfort afforded by the knowledge that those dependent on them were thus safely provided for

was ample compensation for the expense of the lawyer's fee. With the increase of railroads in the forties the dangers of travelling were seemingly multiplied, and as the community had long enjoyed the advantages of life and fire insurance, some far-seeing gentle-



men held a meeting on December 15th, 1848, with a view to founding a system of insurance against railway accidents. It was decided at this meeting to call the institution "The Universal Railway Casualty Compensation Company," and as such it was registered. This somewhat clumsy title was, however, changed at the next meeting to that of "The Railway Passengers' Assurance Company," by which designation the Society is still known. It had for its object the establishment of a system of insurance against death or disablement caused by accidents on the railway, which should be both simple in its working and at the same time sufficiently cheap to be available for all classes.

But in the way of putting this laudable scheme into execution lay many obstacles. Not the least among them was the heavy stamp duty then levied by the Government on any

such insurance as that proposed. The capital of the Company was £17,500, and it was proposed to issue 1d., 2d., and 3d. insurance tickets, a scale of charges which the above-mentioned stamp duty would have rendered impossible. Under these circumstances it became necessary to appeal to Parliament. The application of the directors was successful, and a Bill, known as 12 and 13 Vic., cap. 40—the first, but by no means the last, which the Company obtained—received the Royal Assent on June 26th, 1849, by the provisions of which the issue of unstamped tickets was declared to be lawful. In lieu of stamp duty the Company were allowed to pay a composition duty on the gross receipts, due security for faithful payment being given. This Bill also contained several clauses which are still in force at the present time, some of them being, moreover, of the highest importance. One was to the effect that no insurance ticket could be issued to any person under the age of twelve years. The reason for this proviso is obvious. All systems of child life insurance offer a temptation to unscrupulous or impecunious parents to make away with superfluous offspring, and such a crime is not difficult of accomplishment whilst on a railway journey.

But the most important clause of all stipulated that the payments received from the Company should in no case be taken in dimi-



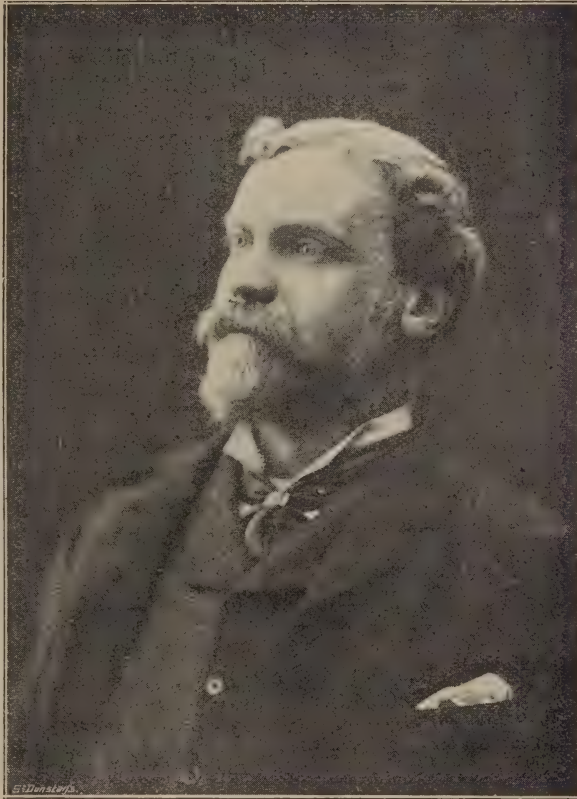
TRAVELLING ON THE LONDON AND BIRMINGHAM R.WY. IN 1837

nution of damages obtainable elsewhere. This meant that any payment on account of insurance made by the Railway Passengers' Assurance Company did not relieve the railway companies of any portion of their liability to

fully compensate injured passengers or, in the case of a fatal accident, the victim's relatives.

The peculiar and unique footing upon which this clause placed the new Insurance Company was, and still is, solely to the advantage of the passenger, who requires protection whether or no damages are forthcoming. For it should be borne in mind

that a railway company *is not liable in damages for accidents which are the result of "force majeure."* This fact is, we believe, not properly appreciated by the public at large. As a case in point, may be cited the accident which recently occurred through a signal becoming blocked by snow and failing to respond to the movement of the lever; whilst the Chelford disaster, caused by a truck being blown out on to the main line from a siding, furnishes another example of a disaster which it was virtually impossible to prevent. In neither of the above in-



MR. ALFRED VIAN
Secretary, Railway Passengers' Assurance Company

stances was the railway company legally liable to liquidate any claims for compensation.

The Act of 1849 went on to deal with the amount payable by the Company to the assured for death or total or partial disablement. In these *fin-de-siècle* days of company promoters and South African millionaires it seems hard to realise the Arcadian simple-mindedness of the framers of this Act. The compensation clause stated that "a fixed sum (amount inserted) shall be paid for death in-

cident to and consequent on railway travelling"; and for injury "an amount such as shall be deemed a reasonable and liberal compensation for such injury, as well as for the pain of mind and body and the loss of time and money consequent thereon."

The enormous latitude which the wording of the clause gave to claimants will at once be perceived; and, seeing how, "above all things evil and desperately wicked" is the heart of man, the extent to which the Company's liberality was abused by the advancement of preposterous claims for injuries will be readily understood. The phrase "pain of mind and body" lent itself especially capable to a wide interpretation.

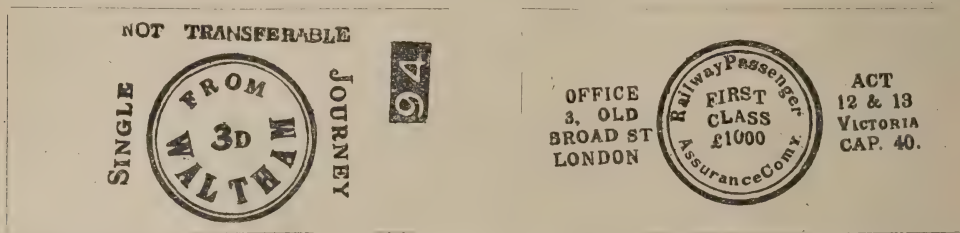
The issue of tickets in accordance with the provisions of this Act marks what may be termed the first stage of the Company's existence—*i.e.*, a period during which no fixed scale for payment of insurance money was in operation.

Another great difficulty with which the Company found themselves confronted at the outset of their career was that of persuading people of the genuineness of their system. The average traveller, in the early days of railroads, found it very hard to grasp the fact that by payment of such a small sum, he became entitled to such large contingent benefits. Nevertheless, when once he had purchased a ticket he did not hesitate; should opportunity

arise, to utilise to the fullest possible extent the advantages which it offered him.

The Company were compelled, in the first instance, to limit the issue of insurance tickets

Department was established in the Clearing House for promptly dealing with the returns from the various lines of the tickets issued, a similar arrangement being made



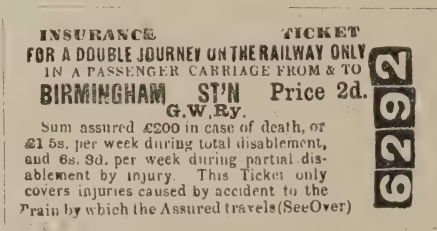
ONE OF THE EARLIEST ASSURANCE TICKETS ISSUED BY THE RAILWAY PASSENGERS' ASSURANCE COMPANY

for large sums to first-class passengers only. The risks incidental to travelling in roofless second and third-class carriages (which were only attached to slow trains) were too ruinous for the Company to be willing to insure passengers' against them for any considerable amount.

The scheme was gradually approved by railway directors and managers generally, without whose cordial co-operation, indeed, it could not have been effectually carried out in the first instance. The insurance, while affording an attractive security to the traveller, was recognised as conducing to railway interests, and Mr.

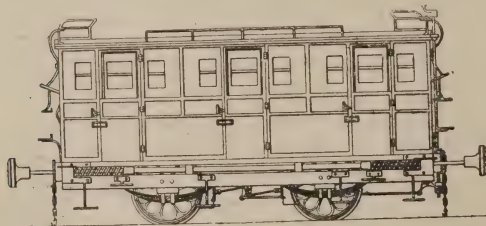
later on with the Irish Railway Clearing House.

The first half-yearly meeting was held on March 6th, 1850, at 3 Old Broad Street, under the chairmanship of John Dean Paul, who afterwards succeeded to a baronetcy and earned an unenviable notoriety in connection with certain matters extraneous to his connection with the Company. Amongst the first directors were James Clay, the well-known member for Hull,



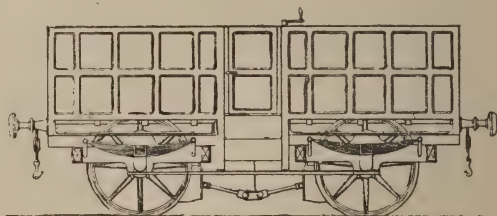
A PRESENT DAY TICKET OF THE RAILWAY PASSENGERS' ASSURANCE COMPANY

the Hon. Arthur Kinnaird (afterwards Lord Kinnaird), and Harvie Farquhar, of Messrs. Herries and Co., an old-established West-end bank. Each of these gentlemen became in



2ND CLASS CARRIAGE

THE BIRMINGHAM AND GLOUCESTER RAILWAY IN 1849



3RD CLASS CARRIAGE

Morison, the first Secretary of the Railway Clearing House, became a warm supporter of the venture. It was by his arrangement that the Railway Passengers' Assurance

turn Chairman of the Company. At this meeting the sum received in premiums was stated to be £1,421, and the compensation paid to amount to £7 10s. The

Chairman, moreover, announced that the London and North Western Railway Company had taken "an honourable lead in giving the public the opportunity of availing themselves of the advantages afforded by the Company to travellers," and that some twenty-six other railways had followed suit. He also gave expression to optimistic views concerning the future of the Company, which were unfortunately not immediately realised. Claims soon became heavy, and the ratio of the working expenses to the receipts was high, taking into account the smallness of the latter.

Parliament was again appealed to, and a scale of proportionate payments sanctioned. This change marks the second stage of the Company's advancement.

They were undoubtedly from the first most fortunate in their officers, and in none more so than in Mr. W. J. Vian, who entered their service in August, 1849, and was appointed Secretary in February, 1852, his predecessor, Mr. Alexander Beattie, taking a seat on the board.

Mr. Vian devoted himself with unfailing assiduity to the interests of the Company, and it is mainly owing to his exertions that it occupies its present prominent position. Upon his death, in 1890, his brother, Mr. Alfred Vian (who had been identified with the Company since



64, CORNHILL
The Head Offices of the Railway Passengers' Assurance Company

1861), succeeded him (jointly with Mr. W. D. Massy, whose health, unfortunately, rendered retirement necessary in 1894), and under his able administration the Company has still further prospered. But we are anticipating.

In 1855 the Company, with the sanction of Parliament, extended its business to insurance against accidents of all kinds. This new departure was, however, marked by a serious loss—serious, that is to say, for a Company with so small a revenue. It came about in this wise. Policies were issued for £1,000 each to a father and his son, the former, as was subsequently ascertained, having for a time, at all events, been in receipt of parochial relief, and the latter being in poor circumstances. They were both drowned, and there were features in the case which pointed to an attempt on the part of the son to make away with the father and losing his own life in the venture. The Company promptly paid over the £2,000 claimed, but it was a serious matter for them.

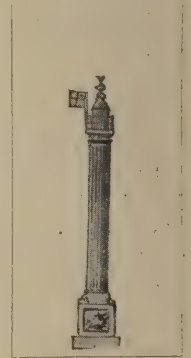
In spite of these occasional set-backs the Company progressed steadily in public favour, and their receipts naturally increased as the advantages which they offered were more fully appreciated. In 1860 the offices were removed to 64, Cornhill, where they have remained down to the present time. In 1867 the

Company's income from railway and general accident premiums reached £100,000.

In the summer of 1868 one of the worst railway accidents which has ever been known in the British Isles took place. We quote it

later on granted to all classes alike, and these are the actual conditions which obtain at the present time in respect of the issue of insurance tickets.

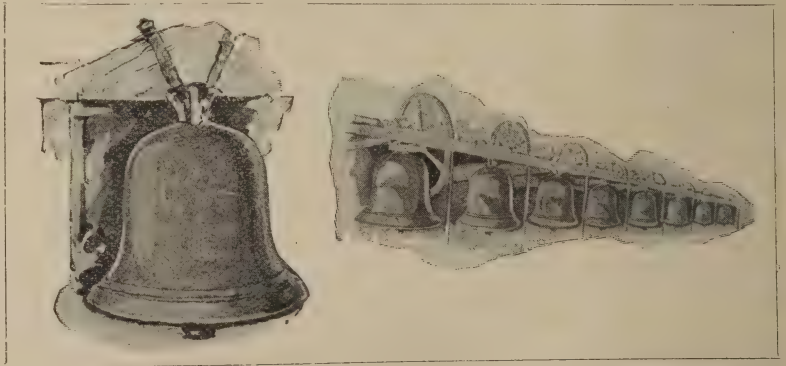
But the Company speedily found that the



IF THE COMPENSATION PAID BY THE RAILWAY PASSENGERS' ASSURANCE COMPANY IN SOVERIGNS WERE PILED ON TOP OF EACH OTHER, THEY WOULD FORM A COLUMN EQUAL TO THE COMBINED HEIGHT OF 51 ST. PAULS, WITH THE MONUMENT THROWN IN

because it affords an example of the liberal-minded policy which the directors have always pursued. The disaster took place at Abergele, and, one of the trains involved subsequently catching fire, many of the passengers were burnt alive. Amongst the latter was Lord Farnham, but as the unfortunate nobleman was completely incinerated it became a difficult matter to prove that he had actually been a passenger by the ill-fated train. However, his signet-ring was found among the ashes, and upon this evidence the Company paid the sum insured.

conditions which Parliament had imposed upon them were both vexatious and onerous. Therefore recourse was again had to that body, and on June 14th, 1875, a fresh Act was obtained. The shares originally issued were 20,000 of



"BIG BEN" WEIGHS 15 TONS 8½ CWT.; THE RAILWAY PASSENGERS' ASSURANCE COMPANY HAS PAID IN CLAIMS GOLD WEIGHING SUFFICIENT TO MAKE TWO "BIG BENS" AND A SET OF CHIMES WEIGHING 1,339 LB.

Soon afterwards the Company entered upon what may be termed their third stage—*i.e.*, that in which a ticket of a certain value insured the purchaser for a fixed sum, a 1d. ticket representing insurance for £100, and so on. The maximum (a 3d. ticket insuring the purchaser for £1,000) was

£50 each, and on these the sum of £17,500 had been paid up. The dividend payable on each share was, however, limited by statute to 4 per cent. (an arrangement somewhat modified subsequently), until such time as the whole of the £1,000,000 capital should be paid up

out of profits. Under this provision the original sum of £17,500 had increased to £100,000, and this amount, plus the surplus always held for outstanding risks, was thought to be sufficient security. A redistribution of capital was also contemplated in the shape of a division of the 20,000 £50 shares into 100,000 £10 shares. The latter scheme was duly authorised, but Parliament decided that, for the better security of the public, the Company must continue to set aside a portion of the profits until £200,000 had been paid up. There is, of course, no appeal from a Parliamentary decision, and the Company were perforce compelled to accept these terms, although an unnecessarily large capital is but a burden to an insurance company.

than five Acts of Parliament and three deeds of settlement—a truly formidable array of guides and monitors!

The important features of these various enactments were therefore embodied in a Consolidation Act, which duly obtained Parliamentary sanction, and has been found to work most satisfactorily.

The scope of the Company's business has been largely extended of late years, and, as was only to be expected, the Workmen's Compensation Act of 1897, which was the natural sequel to the Employers' Liability Act of 1880, has opened up a new field for operations. These two Acts have effectually paved the way for others of a similar character, and no doubt the Company will presently be called upon to


INSURANCE

For a Double journey on the Railway only, in a First Class Carriage From and to

HIGHBRIDGE ST'N B & E. R.

Sum assured **£1000**, in case of death with proportionate compensation for personal injury.

TICKET



OBSERVE

The holder is recommended to write his name on the other side before commencing the journey, as a means of identification in case of fatal accident. In the event of injury, notice must forthwith be given to the SECRETARY of the RAILWAY PASSENGERS ASSURANCE CO 8 Old Broad Street, LONDON

To transfer this Ticket is punishable as a misdemeanour, under the Company's ACT OF PARLIAMENT. 12. & 13. Vic. Cap 40. & 15. & 16. Vic. c. 100.

A RAILWAY PASSENGER'S ASSURANCE TICKET ISSUED BY THE COMPANY 40 YEARS AGO

In 1880 the Employers' Liability Act was passed, and this led, in 1881 to a further application to Parliament by the Company for an extension of their powers. The required Bill (44 Vic., cap. 41) was duly obtained, and the Company became entitled to insure employers of labour against compensation claims which might be lodged by their employés. This may be said to be the first year in which the Company began to insure capital against the demands of labour. Hitherto its operations had been entirely in the other direction, and this new move may be taken as the first significant sign of the times—a sign pregnant with true portent, as we shall show later on.

In 1887 the Right Hon. Evelyn Ashley was elected Chairman (in succession to the late Mr. Harvie Farquhar), a position which he ably fills at the present time.

The Company were now carrying on business under the hampering restrictions of no fewer

insure employers of labour against still further developments. A claim for £180 (such as was paid within a few weeks) in respect of the death of one of their servants is a very serious matter for a small railway company, and several such cases in a year might seriously affect its dividend.

For the following figures, illustrative of the Company's financial position and the extent of its business, we are indebted to the exceedingly interesting brochure written by Mr. A. Vian in commemoration of the Company's jubilee, which it celebrates this year:—

"In 1893 the sum paid as compensation was £146,717, and the variations in the amounts disbursed year by year certainly support the contention that large funds and ample security are called for in the transaction of accident insurance. . . . During its fifty years' experience the Company has paid away over £4,000,000 in compensation. Few, perhaps,

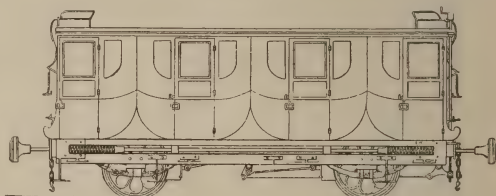
realise what such a sum means; but it may, perhaps, be better appreciated by some illustrations. Taking the average height of a man as 5ft. 8in., a column of four million sovereigns, piled flat one upon another, would be equivalent to the height of 3,676 men, with a young person of 2ft. 8in. thrown in. Again, the height of St. Paul's is 404ft. The height of the column named would be 3 miles 1,664 yards, or equal to the height of 51 such buildings, with so much to spare as would top the Monument in the City of London by 2ft. 8in. Placed in a single line, side by side, the line would reach a length of over 55½ miles. If £4,000,000 be looked at from the point of view of weight, taking the average man as 12½ stone, the weight of the sovereigns handed out for losses would equal that of 402 men, plus a light-weight of 6st. 9lb. The biggest bell in the country is 'Big Ben' of Westminster, which weighs 15 tons 8½ cwt. The Company has paid away a weight of gold enough to make two such bells, with an insignificant 1,339lb. over for the chimes."

The paid up capital of the Company is now £200,000, and there is a further fund of over £120,000 for unexpired risks and current security, and a fund of £25,000 as a special reserve. The income from all sources exceeds £250,000. The fully subscribed but unpaid balance of capital which remains intact amounts to £800,000. The bonus reduction of premiums has been to the extent of over £350,000.

These splendid results are largely attributable to the liberality with which the directors have always treated claimants, and the wide view which they take of the contract.

There is usually no difficulty in identifying an insurance ticket-holder in cases of railway accident; but where the accident is very destructive a difficulty is possible, as we have seen. After the Wrawby Junction disaster it was proved that a £1,000 insurance ticket had been issued to one of the victims, but this ticket could nowhere be found. A search was instituted, and it was finally discovered near a purse which was picked up on the line at some distance from the scene of the catastrophe.

There is no doubt that a ticket is an infinitely preferable form of insurance policy to a newspaper coupon. In the latter case, unless the coupon has been actually signed or left at home, there is very great difficulty in proving after a railway accident to which particular person any given newspaper belonged. Unless the purchaser has put it in his pocket—a somewhat unlikely proceeding—there is no means of proving that he was the real owner of the journal in question. The average man throws down a newspaper when he has done with it, whereas he would be almost certain to put an insurance ticket into one of his pockets if he had not already posted it to his home.



1ST CLASS CARRIAGE OF THE BIRMINGHAM
AND GLOUCESTER Rwy. IN 1849

The validity of this contention received a practical illustration after the Carlisle disaster, when, as my readers will doubtless recollect, the ownership of an insurance ticket was satisfactorily proved, whereas the ownership of various newspapers with insurance coupons could not be established.

It is a curious fact that the sale of insurance tickets rose to a certain point, and, since reaching it, has remained almost stationary during the last twenty-five years. This is no doubt due to the constant diminution in the number of preventible railway accidents which occur, but, as we pointed out earlier in the present article, such a state of affairs is in reality an additional reason why the public should insure themselves.

The tendency on the part of the public is now undoubtedly to insure for the highest possible amount. The Company's figures for the last year or two are proof of this.

A good story is told of a betting man who was in the habit of regularly purchasing an insurance ticket whenever he went on his

travels. Once he failed so to do, and his train was in imminent danger. His disgust knew no bounds. "Here have I been betting on this coming off all my life," he said, "and, now that it has, d——d if I've got a bit on!"

There is one sadly dramatic history associated with an insurance ticket. A gentleman purchased one prior to starting on a journey, and, as is frequently done, posted it home to his wife from the departure station. The ticket was delivered simultaneously with an intimation from the railway company announcing that he had lost his life in a railway accident.

In the case of the Tay Bridge disaster an insurance ticket was discovered upon the body of one of the victims. The ticket had been reduced to absolute pulp by the action of the sea-water, but under a microscope the printing could still be traced. The Company thereupon admitted the claim and duly paid over the amount of the insurance money.

After any big railway accident the Company usually send their inspector to inquire of the injured persons whether they have purchased insurance tickets or not. The number who have failed to do so on the particular occasion of the catastrophe, but have never previously omitted to take such a precaution, is always astonishingly large!

After the death of one victim of a railway accident his estate was proved at £1,000 7s. 1d. An insurance ticket represented the "pounds" column of the above figures, whilst his "personal estate" accounted for the remaining 7s. 1d.!

In the various branches of insurance the Company have had many strange experiences, and have lost many policy-holders through foul

play of different descriptions, as in the case of a manufacturer murdered by his dismissed clerk, of a keeper killed by a poacher, and so on. On the other hand, several people have remained alive who, according to post-mortem medical testimony, performed a miracle by so doing. One man, in passing under a low archway, slightly forced his hat down over his eyes and straightway died from a fracture of the skull. It was found afterwards that his headpiece was of such abnormal thinness that the lightest blow thereon at any period of his life must infallibly have proved fatal. And yet he reached middle age!

Another gentleman, also a policy-holder, exhibited totally opposite qualities. He fractured his skull by a fall, but walked about in complete ignorance of the fact for six weeks! At the end of that time he became ill and died, and then, of course, his injury was discovered. Medical science has not proved equal to the task of explaining why he did not do so six weeks earlier.

As showing the fatal results which sometimes follow on the most trivial incidents, the case of a merchant may be cited who, whilst out walking, slipped on some dead leaves. He died from the effects of his fall.

As railways multiply so will the operations of the Railway Passengers' Assurance Company, and there seems no reason why that body should not, in fifty years' time, celebrate their centenary still more triumphantly than they are now doing their jubilee.

The best thanks of the writer are due to Mr. Vian for having courteously placed all information at his disposal, and he also again desires to acknowledge his indebtedness to that gentleman's brochure for many of the facts contained in this article.





THE FAMOUS GINGERTUBBE CORRESPONDENCE



BY W. S. BEESTON *Audit Office, Great Northern Railway*



LAST year it was noticed in the railway world that the little Lizard and Alderney Railway very suddenly held its head higher than usual. Many guesses were hazarded at the

time as to what was the meaning of this, for no company had been more meek and mild, and this startling change caused the greatest astonishment. Increase of traffic, new capital, the discovery of a gold mine on its property, and many other reasons were spoken of as the cause, but at last the truth has been given to the whole world by the publication of the Gingertubbe correspondence by the Company.

The revelation has caused the deepest interest in official circles, clearly proving that even the railway worm will at last turn. A copy of the correspondence is given below, and the cause of what was once a deep mystery is laid bare for the enlightenment of mankind.

[Copy of the Correspondence between Democritus Gingertubbe, Grocer, and the Lizard and Alderney Railway Company.]

The Tea Pot,
High Street, Norton,
June 1st, 1898.

To the Lizard and Alderney Railway Company.

GENTLEMEN,—I very much regret to inform you that the case of Irish eggs, delivered by your Company last night, were damaged, and I must claim 17s. 6d. for same.

Please send your agent to inspect at your earliest convenience, and as we have the whole of our traffic by your line a prompt settlement will oblige,

Yours truly,
DEMOCRITUS GINGERTUBBE.

The Lizard and Alderney Railway,
June 3rd, 1898.

DEAR SIR,—I am in receipt of your favour of the

1st inst., re damage to case of eggs, which shall have attention.

Yours truly,
C. SHARP, Goods Agent.

The Tea Pot,
High Street, Norton,
June 12th, 1898.

To the Lizard and Alderney Railway Company.

GENTLEMEN,—Further to my letter of the 1st inst., I beg to inform you that my claim was under-estimated.

The eggs that were damaged, I find, were laid by the best Cork bantams, and were much superior to my other consignments. I also find that the straw in which they were packed was damaged. As I use this for my horse it is a loss. I also find that my assistant placed several sheets of superfine sugar paper under the damaged case, and this was afterwards quite useless for wrapping up sugar. Under the circumstances, I beg to forward a corrected claim as under:—



To case of eggs damaged (original claim)	17	6
Additional claim on finding eggs were laid by Cork Bantams	9	6
Damage to straw used by my horse	4	
4½ sheets superfine sugar paper	1	½
	£1	7 5½
Less ¼d. (one sheet of paper used for pasting up warehouse window-pane)		½
Postage	£1	7 5
		2
Yours sincerely,	£1	7 7
DEMOCRITUS GINGERTUBBE.		

The Tea Pot,
High Street, Norton,
June 14th, 1898.

To the Lizard and Alderney Railway Company.

GENTLEMEN,—I beg to again repeat you respecting my claim. I have not yet received a settlement, and as the whole of my traffic is carried by your line—I give this preference to your line, although the Sark and Lizard would serve equally as well—I consider you are dealing very unjustly with me. I have turned up my invoices for the past three months, and I find that the total amount paid to you for carriage by my firm—the whole of my traffic is carried by your line—amounted to the respectable figure of £8 17s. 9d. This is the total after my deductions for overcharge in weight, the overcharges amounting to £1 14s. 9d. You made great objection to these deductions, but I can assure you that the goods were weighed on my own machine—a second-hand one, made by Dhuffere in 1791—by my errand boy, who is well up in weights and measures, poetry and provisional equation. You will remember I forwarded in confidence for your private inspection his certificate, given by the School Board. You did not appear satisfied, therefore I sent the lad to you for examination, and you will recollect he only made one mistake, saying 5 quarters made 1 cwt. How he arrived at this conclusion I am unable to say, especially as he repeated his weight and measure tables to me eight or nine times the day before seeing you, and he was then perfectly correct.

As I have before said, the whole of my traffic, by my express command, is given to your line. In addition to my grocery during the last six months, I have had per your line a horse, a cart, and also induced my Aunt Maria, who had never before patronised any railway, to come to see me and to travel by your route. Any line might well be proud of this achievement, and I consider the patronage of my Aunt Maria a good advertisement to any railway. Several sewing societies own her as chief, and she is the presiding genius at all mothers' meetings at Little Norton, and also on the committee of the winter soup kitchen. Her visit was in itself of help to your staff at Norton Station, for I remember each man



was made, through her kindness, the recipient of a kettle-holder with special flaps for Sunday and week-days; a small string of onions (these I supplied to her at slightly above cost price), and a ticket for 2s. worth of provisions for 1s. 10d., if presented at the "Tea Pot" within one week after issue.

In addition to this, as I have already pointed out, I send the whole of my traffic per your route. I cannot, therefore, understand why you have not settled my trifling claim. I notice your dividends have increased during the past ten years, that is, during the time my business has been established, and, without being egotistical, I think I may say the "Tea Pot" and Democritus Gingertubbe have caused the increase. Trusting to have a definite reply,

I remain yours truly,
DEMOCRITUS GINGERTUBBE.

The Lizard and Alderney Railway,
Central Offices,
July 2nd, 1898.

DEAR SIR;—Referring to your past communications and claim *re* case of eggs damaged, I beg to inform you that I have instructed our agent to settle for the amount claimed on your agreeing to the request made in this letter. The whole matter of your traffic has been gone into, and I venture to make the following remarks for your perusal:—

We find that the amount, after deductions, quoted by you as being paid to this Company, viz., £8 17s. 9d. for the three months ending June, is correct. But on April 1st you render to us a claim of 15s. for damage to chest of tea; on April 15th a claim for 10s., delay to a box of apples; April 30th, a claim of 14s. 8d. for damage to a Cheshire cheese; on May 3rd you threw on our hands three hampers of cauliflowers, because delivered after 3 p.m., causing a loss to this Company of 18s. The whole of these claims were settled without demur, as the whole of your traffic came by this line.

With respect to the horse received by you, and on which the carriage amounted to 20s., I find that in loading two of our porters were laid up for a week through kicks, as it was a very vicious brute. In being unloaded it kicked part of the roof off the box in which it was loaded, and damaged a carriage belonging to another consignee. The repairs to our box cost 50s., and to the carriage £22 2s. This Company made no remark at the time, as the whole of your traffic came by this line. On looking over the previous claims mentioned, we find that the chest of tea was of a very superior quality, the apples were an order from one of your best customers, and the cauliflowers were the best you had ever ordered. The cheese also appears to have been

no ordinary Cheshire, but a brand of superlative merit.

Our Company regrets that damage and delay should have occurred to the articles mentioned, especially as their quality appears to have been of the best, and as the whole of your traffic has been sent by this line. I sincerely thank your Aunt Maria for presenting our staff with the gifts that you have quoted, but as our men at Norton are nearly all single, the kettle-holders with special flaps for Sundays and week-days were of very little service.

I also find that only one porter made use of your 1s. 10d. tea ticket, and it appears that our staff lost many tips from passengers owing to the onions. Their strength was prodigious, as no one could approach within at least two yards of the men who had partaken of them. I have filed twenty-two reports from users of our station complaining of the terrible odour which pervaded the place, and I am sure that the fall of traffic from Norton during this time could be put down to no other cause than "Onions."

Your Aunt Maria also brought a large amount of luggage with her—ten boxes, a bicycle, sewing machine, one dog, and two cats. She declined to pay ex-



cess, and the matter was not pressed by our people, as the whole of your traffic was given to this Company.

I beg to attach a statement for your inspection,

and feel sure that if your business had been established twenty years ago and the whole of your traffic had been sent by this line, our Company would in self-defence close the station at Norton.

In conclusion, I earnestly ask that in future you will be good enough to send the whole of your traffic by our rival line. On receiving an assurance that the whole of your goods, your horses, and Aunt Maria will cease to use our system, the claim under consideration will be paid.

Lizard and Alderney Railway Company.

Cr.

Amount paid by Democritus Ginger-			
tubbe to the L. and A. Rwy Co. for			
carriage of goods, etc.	8	17	9
Aunt Maria's fare (Little Norton to			
Norton and back)	2	9	
	<hr/>		
	£9	0	6

Lizard and Alderney Railway Company.

Dr.

Claim on superior chest of tea ...	15	0	
Delay to box of best apples ...	10	0	
Damage to superior Cheshire cheese ...	14	8	
Refusal of cauliflowers ...	18	0	
Repairs to horse-box damaged by your			
horse	2	10	0
Repairs to private carriage damaged			
by your horse	2	2	0
Aunt Maria's excess luggage ...	10	9	
Aunt Maria's dog			6
Falling off of traffic during "Onion"			
week	14	10	8
	<hr/>		
	£22	11	7
Credit	9	0	6
To Balance	13	11	1
	<hr/>		
	£22	11	7

Yours truly,

A. FAIRPLAY, Goods Manager.

Democritus Gingertubbe,

Grocer, The Tea Pot, Norton.

"WESTRALIAN" RAILWAYS

By BRUNEL REDIVIVUS



IN the RAILWAY MAGAZINE for June, 1898, appeared an article describing the progress of the railways of Western Australia. The

Government Papers recently published show that the progress has again been very marked. The report on the working of the Government railways of West Australia is for the year ending June 30th, 1898. The table on the following page, extracted from the above return, shows at a glance the whole history of the Government railways from the engineer's standpoint.



TABLE SHOWING AT A GLANCE THE SALIENT ENGINEERING FEATURES OF THE GOVERNMENT RAILWAYS OF WEST AUSTRALIA ON JUNE 30TH, 1898.

NAME OF LINE.	SUBDIVISION.	Length of Main Line.			Height of Line above Sea.		Steepest Gradient.	Weight of Rails per Yard.	Date when opened for Traffic.	REMARKS.
		Double.	Single.	Total.	Highest.	Lowest.				
Northern ..	Geraldton-Norhampton	Mis. hns 34 17	Mls. 34 17	Mls. Chns 34 17	Feet. 646	Feet. 5	1 in 30	35	July 26th, 1879 ..	0 to 2 miles relaid with 46lb rails in July 1887. { Relaid with 58lb. rails in July, 1893. Present "down" line, Perth-East Perth in June, 1896.
Eastern ..	Fremantle-Guildford	19 63	17 12	21 11	117	25	1, 80	58	March 1st, 1881 ..	..
Do. ..	Guildford-Chidlow's Well	3 79	17 12	21 11	1,055		1, 25	58	March 11th, 1884 ..	..
Do. ..	Perth Racecourse Branch	1 69	..	1 69		9	1, 80	58	January 1st, 1885 ..	Duplicated and relaid with 58lb. rails. Extension of 49 chains opened on 21st October, 1897.
Do. ..	Chidlow's Well-York	..	48 72	48 72	1,068	520	1, 45	58	1885..	..
Do. ..	York-Beverley	..	20 46	20 46	669	580	1, 60	58	August 5th, 1886..	Relaid with 58lb. rails in June, 1893.
Do. ..	Spencer's Brook-Norham	..	5 73	5 73	521	490	1, 80	58	October, 1886 ..	Relaid with 58lb. rail in April, 1896.
Northern ..	2 Mile Junction-Walkaway	..	17 53	17 53	98	23	1, 100	46 1/2	July 21st, 1887 ..	..
Eastern ..	Chickline-Newcastle	..	14 34	14 34	1,147	443	1, 40	45 1/2	January 3rd 1888 ..	Line extended 23 chains in 1896.
South-Western ..	Bunbury-Boyanup	..	16 04	16 04	125	2	1, 90	45	March 12th 1891 ..	Relaid with 45lb. rails in August, 1896.
Do. ..	East Perth-Pinjarrah	..	53 28	53 28	197	11	1, 75	46 1/2	May 2nd 1893 ..	..
Do. ..	Pinjarrah-Pictou Junction	..	56 71	56 71	140	26	1, 75	46 1/2	August 22nd, 1893 ..	..
Do. ..	Boyanup-Minninup (Donnybrook)	..	9 58	9 58	210	121	1, 80	45	November 16th 1893 ..	..
Eastern ..	Norham-Southern Cross	..	170 1	170 1	1,492	489	1, 60	45, 46 1/2 & 58	July 1st, 1894 ..	Section Grass Valley-Meckering relaid with 58lb. rails in July, 1897.
Northern ..	9-Mile Junction-Mullewa	..	57 7	57 7	976	79	1, 50	45	November 21st 1894 ..	..
South-Western ..	Boyanup-Russellton	..	27 78	27 78	124	7	1, 75	45	December 26th, 1895 ..	..
Do. ..	Canning Racecourse Branch..	..	0 46	0 46	34	26	1, 69	46 1/2	February 22nd, 1896 ..	..
Eastern ..	Mahogany Creek Deviation ..	..	11 71	11 71	971	59	1, 50	58	July 1st, 1896 ..	Exclusive of second line from Bellevue to Mid-land Junction, now used as an "up" road of double line.
Do. ..	Southern Cross-Boorabbin	..	60 20	60 20	1,572	1,140	1, 60	45	July 1st, 1896 ..	..
Great Southern ..	Beverley-Albany Jetty ..	..	243 0	243 0	1,313	8	1, 55	46 1/2	December 1st, 1896 ..	..
Eastern ..	Boorabbin-Kalgoorlie ..	..	78 10	78 10	1,537	1,192	1, 60	45	January 1st, 1897 ..	Taken over for maintenance on 5th August, 1897.
Do. ..	Kalgoorlie Boulder & Lakeside	..	9 11	9 11	1,290	1,078	1, 60	58	November 8th, 1897 ..	Taken over for maintenance on 1st Feb., 1898.
South-Western ..	Bunbury Racecourse Branch..	..	1 48	1 48	28	5	1, 67	58	November 17th 1897 ..	Not yet taken over for maintenance.
Kanowna ..	Kalgoorlie-Kanowna ..	..	12 06	12 06	1,319	1,195	1, 60	58	June 15th, 1898 ..	Taken over for maintenance on 20th June, 1898.
		25 51	966 46	992 17						

SIDING ACCOMMODATION.			
Eastern Railway (Fremantle-Kalgoorlie and Branches)	Mls. Chns. 92 11	Mls. Chns. 92 11	Mls. Chns. 92 11
South-Western Railways ..	.. 18 79	.. 18 79	.. 18 79
Northern Railways ..	.. 5 31	.. 5 31	.. 5 31
Great Southern Railway ..	.. 13 41	.. 13 41	.. 13 41
Grand Total of Main Line and Sidings	1,124 24	1,124 24	1,124 24

SUMMARY OF RAILWAYS OPEN ON 30TH JUNE, 1898.			
Eastern Railway (Fremantle to Kalgoorlie), including Perth Racecourse, Newcastle, Beverley, Kanowna and Boulder Branches, and Mahogany Creek Deviation ..	474 07	474 07	474 07
South-Western Railway (including Donnybrook and Busselton Branches, and Canning and Bunbury Racecourses)	166 13	166 13	166 13
Northern Railways (Geraldton-Mullewa), including Walkaway and Northampton Branches ..	108 77	108 77	108 77
Great Southern Railway (Beverley to Albany) ..	243 0	243 0	243 0
Total Mileage ..	992 17	992 17	992 17

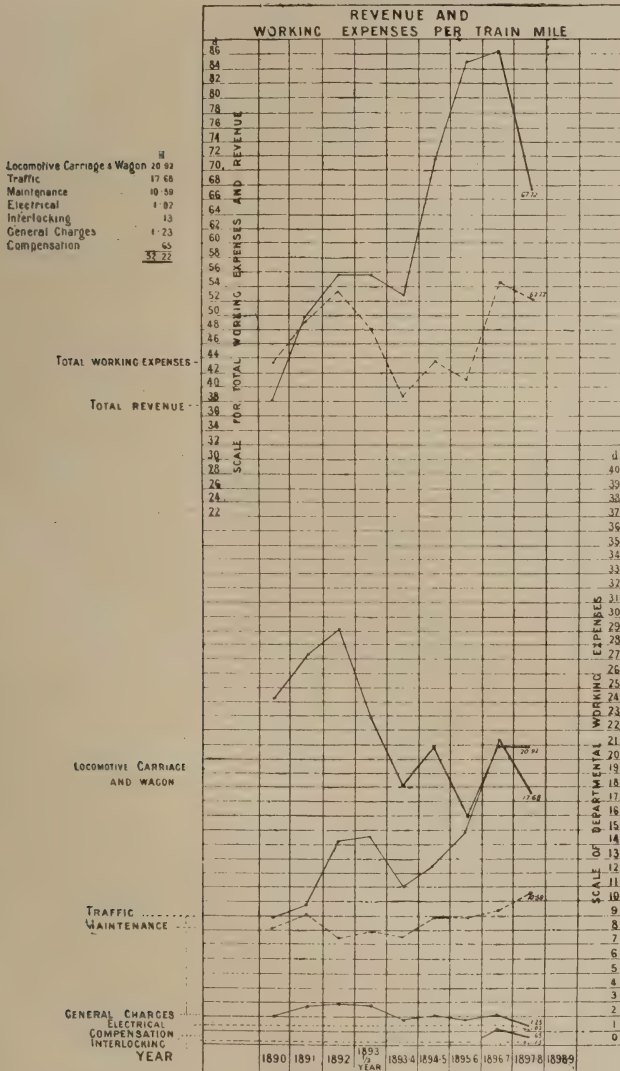
The railways under construction in the Colony at the time were as follows:—

Railway	Miles
1. Cue Railway (from Mullewa to Cue).....	196½
2. Collie Railway.....	25
3. Bridgetown Railway.....	42½
4. Menzies Railway.....	80
5. Greenhills Railway.....	13½

have to contend is the scarcity of water, the drought being particularly severe during the

To be finished by	Opened on
1-7-98	July, 1898.
1-7-98	August, 1898.
1-8-98	September, 1898.
31-12-98	
1-9-98	Just opened.

DIAGRAM SHOWING



year now under review. The immense sum spent in obtaining water for locomotive purposes and the worry and work caused thereby would appear almost appalling to managers of railways who have never had to contend with difficulties of this nature. The following interesting information on the water troubles is from the General Manager's report, and relates to the goldfields line (Eastern Railway):—

"During the year difficulties in connection with the supply of water for locomotives proved most trying, and a very large expenditure had to be incurred in hauling water from one station to another to enable the Department to continue its train services. Fortunately, the officers in charge of the water supply, by unceasing effort, were able to avoid delays in the conveyance of both passengers and merchandise traffic. This success, however, was only obtained by the officers remaining on duty for days together without any intermission, and rest had to be snatched by them when travelling from place to place, up and down the railway. The scarcity of water had reached a very acute stage indeed, and nearly caused a cessation in the train services on some portions of the goldfields lines. The year proved to be the driest since the opening of the railway from Northam.

"To keep the service going, 55,440,000 gallons of water in 42,000 water travelling tanks, each capable of holding 1,320 gallons and upwards, had to be conveyed on ordinary and special water trains, at an expenditure of 228,606 train miles, representing in money at 4s. 4d. per train mile, a sum of £49,531. Such an extraordinary expenditure increased the working expenses per cent. of revenue by £4.85."

The Locomotive Superintendent also comments on the deficiency of water. He says:—

"The most serious difficulty experienced by the

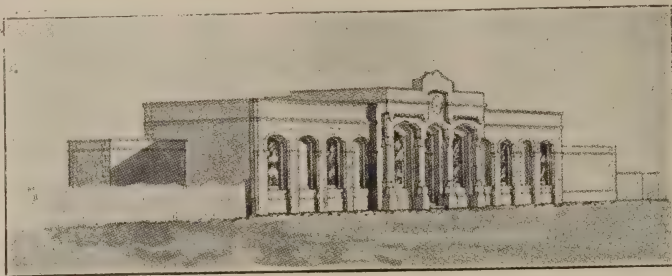
There was also a length of 50 miles (from Cue, the present terminus of the Northern line, to Nannie) authorised in 1897, but not yet commenced.

The great difficulty with which the officials

working railways during the year under review was, perhaps, the failure of the water supply on the Spencer's Brook-Kalgoorlie line. During the term from December

10th to January 2nd, practically all the water required for the operation of this line of 315 miles was pumped from Burlong Pool, and run by special water trains to various points. Considerable disorganisa-

tion ensued, consequent principally on the want of facilities to deal with such an emergency; but by the commendably strenuous exertions of the staff, an absolute failure of the train service was prevented from taking place.



EXTERIOR OF PERTH (W.A.) RAILWAY STATION IN 1891

The experience gained on this occasion has made it clear that a local supply of suitable water must be obtained at Kalgoorlie and Coolgardie,

and I propose to recommend that condensers be erected at these points capable of condensing, together, 70,000 gallons of water per day. We have at present 53,591.800 gallons of water in various reservoirs between Spencer's Brook and Kal-

goorlie, which it is calculated will suffice for requirements until January 5th, 1899, should no further quantity be collected."

The trouble caused by the water supply can be gathered from the annexed table:—

RETURN OF RESERVOIRS FOR RAILWAY WATER SUPPLY, YEAR ENDING 30TH JUNE, 1898, ARRANGED IN ORDER OF MILEAGE ON EACH LINE OF RAILWAY.

Name of Reservoir.	Mileage of Reservoir.	Capacity in Gallons.	Cost of Construction.	Gravitation or Steam Pump.
	M. O.		£	
EASTERN RAILWAY (Fremantle—Kalgoorlie)—	22 28	11,500,000	1,354	Steam Pump; from artesian bore.
Midland Junction	61 10	4,000,000	6,798	Steam Pump.
Clackline Junction	70 58	21,112,000	7,797	Gravitation.
* Spencer's Brook	74 56	28,000,000	..	Steam Pump.
Burlong Pool	76 57	11,291,000	7,773	Gravitation.
* Northam	114 11	12,200,000	6,798	Do.
* Cunderdin	128 63	94,011,000	12,344	Do.
* Tammin	142 73	3,800,000	3,872	Steam Pump.
* Kellerberrin	178 33	7,470,000	5,366	Do.
* Merredun	192 46	8,326,000	6,736	Gravitation.
* Burracoppin	215 38	16,803,000	8,708	Do.
* Bodallin	232 53	7,081,000	9,131	Steam Pump.
* Parker's Road	246 52	643,200	2,411	Do.
* Southern Cross Parsonage	266 67	1,112,075	3,270	Do.
* Yellowdine No. 1	266 67	2,907,000	5,966	Do.
" No. 2	279 7	10,642,225	15,460	Do.
* Karalee	289 35	1,524,000	3,950	Do.
* Koorarawyllee	306 72	968,700	15,001	Do.
* Boorabbin No. 1	306 72	5,452,000	..	..
* " No. 2	312 40	4,845,000	5,994	Gravitation.
Boondi	321 76	1,302,700	3,772	Steam Pump.
* Woolgongie No. 1	321 76	5,572,700	5,550	Do.
" No. 2	343 16	1,198,000	2,912	Do.
* Bullabulling No. 1	343 16	3,592,000	5,000	Do.
" No. 2 .. .. .	.. .. .	.. .. .	.. .. .	.. .. .
GREAT SOUTHERN RAILWAY (Beverley—Albany)—	157 28	2,150,000	Unknown.	Do.
† 195-Mile	203 0	2,150,000	Do.	Do.
† Wagin Lake	262 54	7,000,000	Do.	Do.
Tambellup	284 26	2,150,000	Do.	Do.
Cranbrook	350 17	120,000	Do.	Gravitation.
Albany .. .. .	.. .. .	.. .. .	.. .. .	.. .. .

* Caretakers have been placed at those marked thus.

† Being enlarged at a cost of £1,118; Contract let May 26th for 2,000,000 gallons additional.

‡ Being enlarged at a cost of £1,628; Contract let May 26th for 3,000,000 gallons additional.

HAULAGE POWER OF LOCOMOTIVES. *June 30th, 1898.*

Class	Description of Locomotive.			Type of Engine.		Number of Engines.		Weight of Engine and Tender to nearest Ton.	On Basis of Cylinder Power.																		
	Dia. of cyl. in derg.	Length of Stroke.	Dia. of wheel.	Number of wheels Coupled.	Weight on Coupled wheels.	Number of Engines.			Tractive Force.		Grade.																
						In hand.	Engines in service at end of 1886.		On basis of Perch of 40 lbs. steam in pressure in Cylinder.		On basis of 30 lbs. steam in pressure in Cylinder.		Miles per hour.														
									Lib.	Lbs.	Lib.	Lbs.	10	15	20	25	30	35	40	45	50						
D	9	14	28	4	12	8	1	1	40.5	4232	5555	12	31	39	53	65	77	94									
H	9	14	27	6	14	1	2	2	42	4840	6294	14	31	38	53	66	79	96									
F	10	18	39	4	11	9	1	1	46.1	4846	5129	23	26	35	51	65	80	98									
S	11½	15	36	6	17	0	2	2	55.1	5788	7616	17	42	52	71	88	105	127									
C	10½	18	36	6	18	19	2	2	55.1	5788	8490	26	33	43	62	79	96	118									
A	12	20	39	6	15	9	2-wheel Bogie Tender Engine	10	73.8	7754	6922	30	49	63	88	111	133	163	190	182	236	212	243				
M	12	20	39	6	15	10	2-wheel Bogie Tender Engine	2	73.8	7754	6944	20	49	63	88	111	133	163									
J	13	16	36½	6	22	12	Single Fairlie, 4-wheel Bogie, under Tender, Tank Engine	3	74	7778	10124	37	42	56	81	104	126	157									
P	15	20	54	4	18	18	Tender Engine, 4-wheel Bogie Leading	2	83.3	8750	8467	45	44	60	88	114	139	173	209	193	255	228	265	204	220	190	171
T	15	20	52	4	20	0	Tender Engine, 4-wheel Bogie Leading	10	86.5	9086	8960	50	42	58	85	115	141	176	214	198	262	234	272	208	225	104	175
R	16	22	57	4	22	2	Tender Engine, 4-wheel Bogie Leading	12	98.8	10374	9901	56	49	67	101	132	162	202	244	227	300	268	312	229	238	222	201
L	14	20	39	6	26	15	2-wheel Bogie Tank Engine	1	100.5	10554	11984	30	77	86	121	162	192	233									
N	14	22	42	6	21	12	4-wheel Bogie Tender Engine	3	102.6	10780	9676	49	60	80	115	147	178	220	264	245	321	288	333	269	290	252	
J	15½	21	48	4	22	0	Tank Engine, 4-wheel Bogie at each end	5	105.1	11035	9856	44	68	88	124	156	188	231	277	257	334	303	347	280	301	262	
G	14½	20	39	6	20	15½	2-wheel Bogie Tender Engine	64	107.8	11321	9307	42	72	93	120	164	196	240	287	267	346	312	359				
B	14	21	37	6	24	10	4-wheel Bogie Tank Engine	5	111.2	11681	10976	32	86	107	146	180	214	259	300	280	361	325	374				
Q	15	22	42	6	25	0	Tank Engine, 4-wheel Bogie Leading, 2-wheel Bogie Trailing	6	117.8	12369	11200	39	86	108	150	185	220	269	320	298	385	347	399				
O	15½	21	36	8	29	4	Tender Engine, 2-wheel Bogie Leading	36	140.1	14710	13032	58	91	118	166	208	251	309	370	343	447	401	463				
K	17	21	38	8	36	0	Tank Engine, 2-wheel Bogie Leading, 4-wheel Bogie Trailing	19	159.7	16770	16128	53	117	147	202	252	300	365	434	405	522	471	542				
U	18	24	54	6	32	5	Tender Engine, 4-wheel Bogie Leading	20	144	16560	14448	65	103	133	187	235	282	348	416	386	514	454	522	405	457	380	344
U	13, 20	24	54	6	32	5	Tender Engine, 4-wheel Bogie Leading (4-cyl comp. eng.)	5	144	18000	14448	65	118	150	209	261	313	384	458	426	564	499	573	466	481	419	372

in the calculations for Class U single, leading up to the figures showing the tractive force on basis of cylinder power, the average steam pressure in cylinder has been assumed at 115 lb., and for U comp. cylinders on U comp. are assumed 2 single cylinders with 18 in. diameter each, and for the 4-comp. cylinders on U comp. 12½ in. diameter each.

Interlocking of points was introduced at numerous places on the railways, and the interlocking is being extended. Electric staff working is also in operation on 343 miles of single line, and the use of the electric staff is being extended to other portions of the railways. Electric lighting has been introduced at Freemantle and at the engineers' shops at Midland Junction.

The subject of train lighting has also received considerable attention, and when the General Manager visited England about a year

ago he went thoroughly into the matter, and, after testing the various systems (gas and electric), decided in favour of Stone's system of electric lighting, recommending that it be adopted on the Government railways of Western Australia. Letters from two well-known English railway managers appear in the report. They are strongly in favour of Stone's system, and orders have already been given for several sets of Stone's apparatus.

Coming to the locomotive department, below is a table showing the rolling stock :—



EXTERIOR OF PERTH (W.A.) RAILWAY STATION IN 1893

American Saloons— Old Type.	American Saloons— New Type.	Composite Bogie.	Composite Bogie— Lavatory.	Composite Bogie— Brake.	First Class Bogie.	Second Class Bogie.	Accident Van.	Clemenson's Saloons— 6 wheels.	Composite Cars— 4 wheels.	Second Class Cars.	State Saloon.	Ministerial Car.	Inspection Car.	Sleeping Cars.	Mail Vans.	Passenger Brake Vans.	Goods Brake Vans.	Ballast Brake Vans.	Horse Boxes.	Water Tanks.	Water Tanks—Bogie.	Covered Goods Trucks—4 Wheels.	Covered Goods Trucks—Bogie.
10	2	41	19	30	15	15	1	9	13	4	1	1	3	18	8	91	15 +	1	38	290	16	151	320

Powder Vans— 4 wheels.	Powder Vans—Bogie.	High-Sided Trucks.	Low-Sided Trucks.	Mineral Trucks.	Timber Floats.	Timber Floats— Bogie.	Timber Trucks.	Sheep Trucks.	Sheep Trucks— Bogie.	Cattle Trucks.	Cattle Trucks— Bogie.	Steam Crane Jib.	Line Trucks.	Workmen's Vans.	New Zealand Trucks.	Coal Hopper—Bogie.	Ballast Ploughs.	Ballast Trucks.	Hopper Trucks.	Freight Trucks— Bogie.	Platform Trucks.	Side-Tip Trucks.	Cold Storage Vans.	Cold Storage—Bogie.
10	4	1078 ++	929	35	114 =	64	345	11	50	35	60	1	3	2	34	1	2	75	30	622	50	73	7	12

* Two converted into Inspection Cars.
† Includes two Brake Vans (Bunbury stock) not allowed on main line.
‡ Including nine High Siders (Bunbury Stock) not allowed on main line.
|| Including twelve Timber Floats (Bunbury stock) not allowed on main line.

SUMMARY OF ROLLING STOCK.	
Locomotives	186
Carriages and Passenger Brake Vans.....	289
Wagons and Goods	4,478
Total	4,953

The table on the preceding page, giving full details of the locomotives on the Government railways, is most interesting, and forms a useful model for the locomotive superintendents of home railways. It is to be hoped that ere long the half-yearly reports of British railways will contain a table drawn up somewhat on the plan shown on the preceding page.

Mr. R. B. Campbell, the Locomotive Superintendent, recommends the disposal of the following engines, which are now unsuitable for the work of the railways:—

2 Class "C" ...	Makers—	Stephenson and Co.
1 Class "F" ...	„	Fairlie. Reconstructed by Loco. Department.
2 Class "J" ...	„	Kitson and Co.
3 Class "I" ...	„	Avonside Engine Co.

The financial results of the year's working have been most satisfactory, and cannot be more easily or vividly appreciated than by presenting them in tabular form:—

The expenditure on capital account has been as follows:—

Expended to 30th June, 1897 ...	£3,756,244
Expended during year ended 30th June, 1898 ...	1,312,784
Total (<i>vide</i> Table No. 2) ...	<u>£5,069,028</u>

Total earnings for the year ...	£1,022,425
Total expenditure for the year ...	788,941
Credit balance after paying working expenses ...	233,484
Interest on capital expenditure ...	170,345

Net Credit Balance ...	<u>£63,139</u>
------------------------	----------------

In addition to the above, during the year ended June 30th, 1898, there was expended on improvements to existing lines, which might fairly have been charged to capital account, £63,707.

The following statement will show the increase in passengers, goods, and live stock tonnages over the year 1896-7:—

Number of Passengers ..	5,669,444	3,607,486	2,061,958
Goods Tonnage ..	1 187,781	845,225	342,556
Live Stock Tonnage ..	16,130	13,523	2,607

In conclusion, four illustrations of the exterior of Perth railway station are reproduced. They show the remarkable growth of railway traffic at Perth, necessitating frequent additions to the accommodation at that station.

It is hardly necessary to refer to these illustrations in detail, as the inscriptions under



INTERIOR OF PERTH (WEST AUSTRALIA) PASSENGER STATION.



ELEVATION OF PERTH RAILWAY STATION AND GENERAL OFFICE,

each indicate the extent of the enlargements at various dates. When the imposing pile of buildings shown below is completed Perth will probably possess the finest railway station to be found in any of our Colonies (excepting, of course, India). There can be no doubt that

the Westralian railways have been abnormally successful since the discovery of gold in the district. The success is, without doubt, due to this discovery, but there is no reason why, when the boom is past, the railways already constructed should be unsuccessful.



EXTERIOR OF PERTH STATION (W.A.) SHOWING PROPOSED ADDITIONAL STOREY AND CLOCK TOWER

HOW THE RAILWAYS DEAL WITH SPECIAL CLASSES OF TRAFFIC

III.—HISTON JAM TRAFFIC.

By A. C. CHAUNCEY, *Great Eastern Railway* Illustrations from
photographs by MISS ALICE PAIGE, *Histon*.



CROOKED" Histon it is called, on account of the quaint old winding streets. It is a pretty little Cambridgeshire village, within ten minutes by train of the classic county town.

If it were safe to mount the tower of the ancient Histon Parish Church you could see Cambridge in the distance, and the River Cam winding away from you. The old cruciform church, with its central tower, we might stop to admire were it not that we did not come to Histon to admire its many quaint beauties.

But, stay; we might, if it be possible, mount that tower to view the signs of the staple industry of the place—the forests of fruit trees and the acres of land which, in the season, are red with the luscious strawberry. Histon and Impington—the two

villages are so closely allied as to make one—between them boast a population of some fifteen hundred souls. Histon Station is on the Cambridge and St. Ives branch of the Great Eastern Railway. It is well served with passenger trains, some ten

or eleven trains calling there in each direction daily. The Midland Company have running powers over the line between Huntingdon and Cambridge, so that one can go direct from the latter place to Kettering, Leicester, and other large towns in the Midlands.

One would hardly think that a village of 1,500 inhabitants would require a railway station at all, but you are astonished at the work these fifteen hundred pairs of hands find for a large railway company. The total tonnage of goods traffic, inwards and outwards, dealt with at Histon Station during the twelve months ended November, 1898, exclusive of coal, was 20,099 tons. To show that the traffic is on a healthy increase it may not be out of



VIEW OF CHIVERS' JAM FACTORY AT HISTON

place to give the tonnage for a few of the preceding years. It is as follows:—1894, 10,546; 1895, 14,170; 1896, 16,130; 1897, 17,888; 1898, 20,099. Of this tonnage 90 per cent. would be derivable from the staple industry of the district—namely, fruit preserving.

It is our purpose to show how the railway company deals with this respectable amount of traffic. In the first place, with economy. The staff at Histon consists of the station-master, four clerks, four porters, two signalmen, and two gatemen. The genial station-master smiled when it was suggested to him that the receipts more than paid the salary of

station roughly packed in hampers, it would entail a much greater amount of labour, a hurrying away of costly special fruit trains and what not. But the Histon people know a better method than that. The late Mr. Gladstone, on a memorable occasion some fifteen years ago, lectured on jam, and strongly recommended farmers, when other things were

not going well, to turn their attention to jam production. His opponents laughed, and his friends even were amused, but the villagers of Histon had some ten years previously found there was money to be made from fruit preserving, and have since shown that others might have taken the lecture to heart with advantage; at any rate, the growing up of an industry which can pay a railway company annually over twelve thousand pounds shows that there was a great deal in the "grand old" statesman's remarks.

July, August, and September are the busy months, and then the roads are alive with carts of all sorts carrying the freshly-gathered fruit to the factory, each cart proclaiming by its fragrance

the nature of its contents, and it is no uncommon sight to see as many as thirty carts, one behind the other, awaiting admission to the factory.

There are six goods trains daily arriving at and departing from Histon. These trains between them bring in some forty to fifty trucks of inwards traffic for the jam-making industry—sugar from Amsterdam, Hamburg, and other places, and the glass and earthenware jars from Newcastle, Chesterfield, St. Helen's, etc. The trucks do not take long to deal with; they are shunted into the siding. The siding is on the Company's land, where it adjoins the factory. They are left there to be unloaded by the consignees, and are in turn loaded with the finished article and taken away again on the outgoing goods trains. There is therefore no collection or delivery by cart, and herein lies the explanation of the Company being able to deal with so large a traffic with only a small staff.

The outwards traffic, of course, entails more



INTERIOR OF GREAT EASTERN RAILWAY GOODS OFFICE AT HISTON.

himself and his staff. The suggestion drew from him the information that the fruit-preserving industry alone brought into the pockets of the Company during 1898 no less a sum than £12,294.

During 1898 there were dealt with at the goods office no less than 28,973 outwards and 11,641 inwards invoices. When it is borne in mind that the invoice is but the beginning of all railway work, and that each invoice means an abstract, to say nothing of its being copied and undergoing the hundred-and-one other little processes to which an invoice is heir, it will be seen that the four clerks have not altogether an idle time.

The first thing that strikes one is the compactness, so to speak, of the traffic that is dealt with here. It is, perhaps, a traffic that, for its size, gives as little trouble as any other we can think of. If the fruit grown in the surrounding country were sent to London or elsewhere just as it was picked, carted to the

work. The consignments are smaller and more numerous, and this is evidenced by the fact already noted that the "outwards" in-

train at 6.20 nightly for Cambridge to connect with the fast through goods trains from London to the North of England and Scotland.



SIDING FOR DEALING WITH JAM TRAFFIC AT HISTON STATION, GREAT EASTERN RAILWAY

voices number more than twice and nearly three times the "inwards." The outwards traffic nearly all comes under the classification:—

Preserves (fish, fruit, and provisions) in casks, boxes, or cases.....	} Class 2.
--	------------

so that it pays a fair rate. It is packed in neat, partitioned wooden boxes, or in casks, and is not difficult to handle, which is, of course, a consideration to the Company, as although the factory employes load it into the trucks, it has to be handled at the tranship and receiving stations. Daily as many as five truckloads of London traffic are sent away in through trucks to Bishopsgate Station, whence delivery is effected to all parts of the metropolis. There are three truckloads as a rule for Cambridge, whereat the goods are transhipped for various parts of the North, two or more to Whitmoor, Norwich, Peterborough, Kettering, Leicester, and other large centres.

Recently the Great Eastern Railway Company have started running a special

There is nothing pretentious about Histon Station. Its passenger side consists of two platforms, and there is not even an accommodating foot-bridge whereby the line can be crossed, which is, all things considered, a blessing to a man in a hurry. The gates at the level crossing at the Cambridge end of the platform, however, are a guide, and when these are closed against the trains even the most timid may cross without anxiety. The stationmaster has a cosy little office on the up platform, and he has but to open a door to walk into his house, so that he may truly be said to reside on the spot.

The station never appears more animated than does anything else at Histon, whose sole aim seems to be to get through as much solid work as possible without making any show at all, and when the passenger trains stop there it is generally to take up or set down some half-dozen passengers only.

The people of Histon find their work at their doors, and do not need to travel afar. The one possible exception to this peaceful



INTERIOR OF GOODS SHED, HISTON STATION, GREAT EASTERN RAILWAY.

state of things, so far as the passenger station is concerned, is in the busy season of the fruit-picking and preserving, when the number of people employed in this work exceeds a thousand. Then the 8.20 train from Cambridge in the morning and the 6.34 back at night are largely patronised by the women and girls employed in the picking of the fruit and the packing of the jams. The General Manager of the Great Eastern Railway recently arranged to carry these workers at a very nominal fare. This had the result of finding a not too hard, and at times an even pleasant outdoor employment for the daughters of many of the railway workers—guards, porters, drivers, shunters, and the like—in the service of his Company at Cambridge Station, so that he did the fruit preservers the service of finding them a highly respectable class of worker, and did his Company's employés the service of putting them in the way of profitable and not over exacting work.

The goods accommodation consists of a nice, well-lighted office, of recent erection comparatively, and a goods shed, which is not of very large proportion; but seeing, as we have before stated, the great bulk of the traffic is dealt with in the special siding, this is of little consequence.

Work commences early in the goods department. There is a goods train timed to arrive as early as 5.25 a.m., and from that time to 10.50 p.m., when there is a goods train in the direction of Cambridge, there is plenty of work to be done by the small though busy staff at Histon Station. The outwards traffic does not, as a rule, require weighing, the packages in which the jams are made up being of a uniform weight.

Claims are happily a rarity, possibly on account of the good packing and the careful handling in transit. If all fruit could be carried by rail in this safe and compact condition how much more simple things would

be! There would not be the hurry and worry connected with the fruit special, the anxiety for it to get to the market, nor the fear of heavy claims in consequence of its not doing so. From their experience at Histon the Great Eastern Company could well urge upon their less fortunate competitors the desirability of fostering a traffic in preserved fruit rather than in perishable goods. For, save and except a few consignments of strawberries in the very busy season, which arrive by passenger train, all the fruit is grown in the neighbourhood.

And is this fruit-growing and preserving an increasing industry? The past five years, as we have shown, give a marked and steady improvement, and, from what can be gleaned by a look over the factory, there appears to be

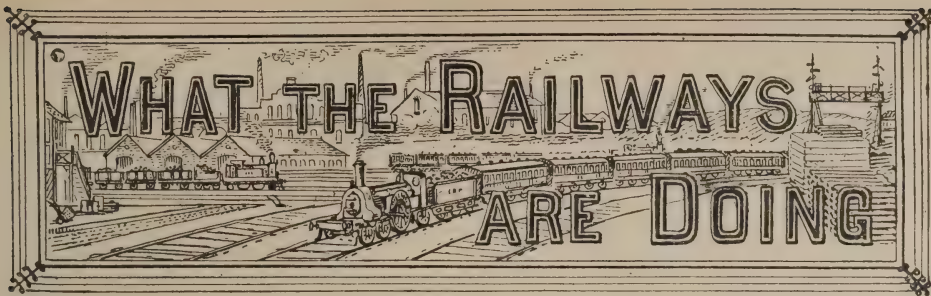


"RUNNING POWERS."

A Midland Railway Train in the Great Eastern Railway Station at Histon.

every likelihood of the improvement being continued; and, as the plant in the factory is shortly to be increased, the Great Eastern people look in the present year for another forward movement.

Histon is a non-competitive station, and all that this word implies is well known to any railway man whose instincts for canvassing are at all developed. They must at least be appreciated by Mr. Roper, the energetic District Goods Manager of the Company, under whose ken Histon Station is, as he works in his office at Cambridge or travels round his wide district and reflects that here, at any rate, nobody else can poach on his "*preserves*."



FURNESS.

THE receipts of this Company, under Mr. Aslett's energetic management, show a substantial increase for the past six months—viz., £16,838.

Ten new goods engines, designed by Mr. Pettigrew, are under construction, and we are glad to observe that these are to be charged to revenue, and not to capital, as is so often done on some lines. The dredging of Pier Bar has been completed, and the Belfast and Isle of Man steamers will now be able to cross the bar in all states of the tide.

GREAT CENTRAL.

Mr. Joseph Rostern has been appointed Assistant to the General Manager. Both Mr. Pollitt and Mr. Rostern are to be congratulated upon the appointment, the former because Mr. Rostern will render considerable assistance in the arduous working appertaining to the General Manager's office now the extension is about to open, and the latter upon the further recognition of his well-known abilities by the directors.

The enlargement of the passenger station at Sheffield is rapidly proceeding, and it is hoped the works will be completed in the ensuing summer. It has been necessary, in connection with this work, to authorise extensive alterations in the arrangement of the goods and passenger lines at the eastern end of the station, which will greatly facilitate the working of the traffic and avoid delays.

GREAT EASTERN.

During the past half-year widening at the following points have been in progress, viz.:—Wroxham to North Walsham, Ilford to Romford, Tendring Hundred line, Bethnal Green to Hackney Downs, Lynn to Wolferton, Reedham to Lowestoft, Temple Mills to Angel Road, and Beccles to Lowestoft.

In addition to the actual passenger coaches, the Great Eastern, under the heading of "coaching" vehicles, include 452 horse boxes, 55 cattle boxes, 186 carriage trucks, 355 brake vans, 23 milk vans, 124 fish vans, 110 sundry vans, 11 tram-cars, 32 omnibuses, and 1 invalid carriage.

It is somewhat disappointing to find that, after struggling against doing so, Mr. Holden proposes to construct 50 locomotives out of capital. Previously, for the past two years, all Great Eastern engines have been built out of revenue, and there can be no doubt (except under exceptional circumstances) this is the right course to adopt. The capital account will suffer to the extent of £85,000 in the matter of the new engines.

In future all first-class carriages which come into the shops for repairs will be fitted with lavatory accommodation, and this convenience is also to be supplied to 70 third class. Four new sets of dining-cars and 30 bogie carriages are to be added to the stock.

GREAT NORTHERN.

One of the latest additions to the Great Northern Railway rolling stock is an 8-wheel bogie passenger brake and luggage van. This van has several novel features, one of them being the provision of sliding doors, which sink flush with the sides of the car when closed.

Readers whose sense of the ludicrous has been excited by the advertisements of removal contractors, which so frequently depict a pantechicon van on a 6-wheel railway "carriage" truck, will now have an opportunity of seeing some of these vehicles, as the Great Northern Railway has just built several. They are 32ft. in length, and are to be used for the conveyance of theatrical scenery, and form the Great Northern's reply to the London and North Western bogie trucks recently constructed for the same class of traffic.

Several sets of new first and third class dining cars for the Manchester service have

also been built at Doncaster. These are of the standard pattern, as used on the Leeds service, and are over 60ft. long and 9ft. wide.

For some years past as many as 14 trains have left King's Cross daily fitted throughout with steam-heating apparatus, and the Great Northern Railway have probably been ahead of any other railway running into London in this respect. In the past it has been customary to feed the trains with steam while standing in the terminus from a local engine, so that the express engine should not have too great a drain upon it during the early part of its journey. The retaining of engines for this purpose must have been very costly and inconvenient in many respects. This method has now been done away with, as lines of steam pipes have been fitted in the departure shed at King's Cross, so that several trains on different sets of rails can be fed with live steam, if necessary, at the same time. The steam is generated in the boiler that was used for electric lighting purposes previous to the construction of the electric lighting station at Holloway being built at the eastern end of Battle Bridge.

Now that engines run up to the buffer-stops in the King's Cross local station, measures will have to be taken to allow the smoke issuing from the engine chimneys to escape through the roof. At present it cannot; consequently the station is frequently filled with volumes of dense smoke, much to the annoyance and injury of passengers, to say nothing of the damage to their clothing.

GREAT WESTERN.

We congratulate Mr. T. H. Rendell upon his appointment as Chief Assistant to Mr. J. L. Wilkinson. To those who have the pleasure of meeting Mr. Rendell frequently, and know his qualifications, the appointment gives general satisfaction.

During the past half-year the locomotive stock of the North Pembroke and Fishguard Railway, comprising three tank engines, two composite and six third-class carriages, six open goods wagons, nine cattle trucks, four timber trucks, and one goods brake van, has been added to the Great Western locomotive and working stock.

The Great Western Railway Company's mail steamer "Pembroke," bound from Milford to Waterford with cargo, passengers, and mails, went ashore during a fog on Saturday

morning, February 18th, on the south-east side of North Saltee Island. The passengers and mails were got off safely and landed at Kilmore Quay.

ISLE OF WIGHT CENTRAL.

The extension of the St. Lawrence branch to Ventnor is being rapidly constructed by Mr. J. T. Firbank, and will probably be opened before the close of the year.

LANCASHIRE AND YORKSHIRE.

During the six months ending December 30th last the Engineers' Department carried on the following work:—Widening line from Deal Street, through Salford Station, to Windsor Bridge Junction. (The strengthening of the old viaduct through Salford is finished, the contract works for the widening are almost completed, and the laying of the permanent-way is in progress.)—Widening and provision of marshalling sidings at Bullfield. (The traffic was diverted over the new line, Lostock Junction to Bullfield, Bolton lines, in October last, and the alteration of the old lines is in progress.)—Extension of goods yard and provision of carriage sidings and loop lines at Daiseyfield, Blackburn. (These works are completed and in use.)—Widening line, Darwen Station to Hollins Sidings, and new goods yard at Hollins. (The works under the widening contract are completed, with the exception of the paving of the goods yard. The warehouse at Hollins is nearly finished.)—Marshalling sidings, etc., at Rose Grove. (On the work in the main contract about two-thirds of the earthwork is done, and the new Rose Grove Lane bridge has been brought into use. The engine-shed walls are built, and the roofing is in progress.)—Connecting line at Bury. (This line was opened for traffic on November 20th, 1898.)—New passenger station and extension of goods yard at Houghton. (About three-quarters of this work is done.)—Extension of passenger station, erection of goods shed, etc., at Whalley. (About one-third of this work is done.)—In addition, contracts for the carrying out of the following work have been let:—Erection of new engine-shed at Accrington; connecting line at Whitehouse Junction, Preston; Contract No. 1, diversion of Cheetnam Hill Road and crossing over River Irk, Victoria Station extension, Manchester; connecting line at Poulton; Contract No. 1,

cab approach from Chapel Street, and additional platform at Blackpool (Central) Station.

LONDON, BRIGHTON AND SOUTH COAST.

At the general meeting of the proprietors of this company, held at London Bridge on January 25th last, it was decided to build 25 new locomotives, 20 lavatory cars, and 15 trains for suburban traffic, composed of bogie cars, at a total estimated cost of £207,500, the same to be charged to capital account; furthermore, £20,000 out of the profits of the last half-year was set aside for the construction of five additional bogie car trains for the same traffic. The whole of these cars will be replete with all the latest improvements. Thus the Company will shortly be in possession of 20 of the finest suburban trains running in the metropolis, being a remarkable departure from the close-coupled four-wheeled stock in general use on the road, which, though not actually worn out, has become obsolete. It is unfortunate that such a large sum should be expended upon capital account for the purchase of new locomotives and rolling stock; these should, except under special circumstances, such as for equipping new branches, etc., be paid for out of revenue. It is abundantly evident that a sufficient amount is not set aside each half-year for the purpose of efficiently maintaining the rolling stock, etc.

A new Royal train has just made its appearance, consisting of three magnificent saloons, two bogie first-class cars, and two baggage cars, the whole train, with clerestory roofs, looking very fine indeed, and reflecting great credit on the company.

LONDON AND NORTH WESTERN.

The Engineer, Mr. F. Stevenson, on February 6th, reported that the large goods warehouse at Broad Street, City, Station is nearly finished, and upon the completion of the cranes and machinery the building will be opened for traffic. At Euston operations have been commenced for the alteration of bridges and retaining walls to enable the approach lines into the station to be improved. Additional siding accommodation has been provided at Willesden Junction and at Nuneaton Station during the past six months. The new passenger and goods station at Morcott, on the Rugby and Stam-

ford Branch, was opened on October 31st last. At Crewe the operations for the station enlargement have advanced rapidly. Nearly two-thirds of the earthwork is complete, and of the 52 miles of new lines and sidings, 20 miles are in use. About one-third of the work has been carried out for the tunnel bridges to pass the goods lines under the passenger lines. The new goods shed has been commenced. The new loop lines at Winsford were opened for traffic on December 19th last. At the Garston Docks, near Liverpool, a large amount of additional siding accommodation is being provided, of which three miles are in use for coal traffic. The cuttings and embankments on the new railway from the North Staffordshire Railway at Ashbourne to the High Peak branch of the London and North Western Railway at Parsley Hay, near Buxton, are approaching completion. The tunnel at Ashbourne, 384 yards in length, has been lined throughout, and nearly the whole of the bridges and viaducts are built. The laying and ballasting of the permanent-way has been commenced. The stations are in hand at Ashbourne, Thorpe Cloud, Fenny Bentley, Tissington, Alsop-en-le-Dale, and Hartington. About 85 per cent. of the excavation has been removed on the new line from Heaton Lodge to Wortley, and 60 out of the 64 bridges and viaducts are constructed, or in progress. The tunnel at Gildersome is lined for 2,000 yards out of 2,334 yards. About one-fourth of the permanent-way has been laid; the stations at Mirfield and Northorpe are nearly finished, and operations have been commenced for those at Heckmondwike, Liversedge, Cleckheaton, Gomersal, Upper Birstall, and Gildersome. On the Chester and Holyhead Railway the foundations are being put in for widening the viaduct to carry the two additional lines of rails over the River Dee at Chester. Between Saltney Junction and Connah's Quay, and between Flint and Abergele, the two additional lines are in use for a length of $9\frac{1}{2}$ miles out of 27 miles. Contracts have been let for further works in connection with the widening of the line, and for the extension of Rhyl passenger station. At Foryd the cylinders are being sunk for the viaduct to carry the two additional lines over the river. Progress is being made with the alterations and additions to the passenger stations at Wolverhampton, Dudley Port, and Great Barr (near Birmingham), also with the

additional siding accommodation at Bank Quay station, Warrington, and with the goods warehouse at Dewsbury. The short branch railway at Peasley Cross, near St. Helens, is approaching completion, and arrangements are being made to commence the deviation and junction lines at Pennington, near Leigh and Bedford. The extension of the Leeds joint goods station is complete, and improvements are being carried out at Huddersfield joint passenger station. Contracts have recently been let for extending the Haydon Square goods station, London, for the widening of the Trent Valley Railway between Atherstone and Tamworth, for goods accommodation at Monmore Green, near Wolverhampton, and for a large warehouse at the Windsor Street dépôt at Birmingham. The abutments are being proceeded with for the widening of the Ribble Viaduct, forming part of the enlargement of the joint station with the Lancashire and Yorkshire Company at Preston, and the temporary staging is being erected over the river to enable the girders to be fixed.

LONDON AND SOUTH WESTERN.

Colonel the Hon. Henry Walter Campbell, son of the first Earl Cawdor and uncle of the present peer, has been appointed Chairman of the London and South Western Railway, in succession to Mr. Wyndham S. Portal, who had held the position since 1892. He is in his sixty-fourth year, and was chosen deputy-chairman when Mr. Portal was elected to the premier post, but for many years previously he acted as one of the directors. The Hon. Henry Campbell retired from the Army in 1886, with the rank of colonel. He saw much active service in the Crimean campaign, 1854-55, as aide-de-camp to Sir William Codrington, taking part in the battles of Alma and Inkerman, and in the operations which led to the fall of Sebastopol. As Earl Cawdor is chairman of the Great Western Railway, the uncle and nephew will be in rather severe (but friendly) competition. Sir C. Scotter, who did so much to improve the London and South Western Railway during the time he held the position of General Manager, has been elected Deputy-Chairman of the railway. Several new inside-cylinder four-coupled express engines, with a leading bogie, are now running. The large rectangular excrescences on the sides of the fire-box of No. 703 (built by Dübs) give her a curious appearance.

SOUTH EASTERN AND CHATHAM AND DOVER.

To the uninitiated the agitation against the joint working of these two railways which some newspapers are trying, by all manner of means, to promote may appear spontaneous. To those behind the scenes, however, it is believed to partake of the character of Naboth's vineyard, it being suggested that another railway wants to acquire the London, Chatham and Dover, and so introduce real (?) competition in the South-East of England. Under such circumstances the newspaper ferment might be part of the means adopted to get the public to favour the new suggestion when the time appears ripe for making it.

The offices of the goods department of these undertakings have been removed to Holborn Viaduct. Business can usually be better conducted when the whole arrangements are carried out at one place; but there may be good reasons why the actual business at Bricklayers' Arms can better be controlled from Holborn.

South Eastern shareholders were greatly interested in the Chairman's statement at the general meeting that the engines for the metropolitan district would be "shedded" at Slade's Green, 15 miles down the line. As this would have meant 30 miles per day of light running for each engine, and in addition about 1½ hours of each engineman's short day's work would be spent in journeying between the London termini and Slade's Green engine shed, it is not surprising to find that the facts are really as follows:—When the new engine shed at Slade's Green, near Dartford, is opened the South Eastern Railway will continue to station the engines commencing their day's work in London at the present dépôts at Cannon Street, Deptford, and Woolwich, and also a few which commence and finish at Rotherhithe Road with empty trains at Bricklayers' Arms, so as to avoid light mileage. As a matter of course, the Slade's Green engine shed will take all engines starting and finishing at Dartford, Plumstead, Woolwich, the Bexley Heath line, Blackheath, and Maze Hill.

No doubt the "Comparative Table of Railway Accounts" in the "Railway Year Book for 1900" will show how the new arrangement works out.

The "Battle of the Brakes" is about to enter on a new and acute phase; it is discussed in our "Pertinent Paragraphs."

PERTINENT PARAGRAPHS

"Railways have rendered more services, and have received less gratitude, than any other institution in the country."—JOHN BRIGHT.



UNDER the joint working agreement between the South Eastern and London, Chatham and Dover Railways, it is proposed to work the two systems as one railway, and use the locomotives and rolling stock indiscriminately

over the whole of the railways. A difficulty, however, presents itself in connection with the continuous brakes. As our readers know, the South Eastern adopted the automatic vacuum, and the London, Chatham and Dover the Westinghouse; therefore, unless both brakes be fitted to all the vehicles (which, of course, will never be done), one of the systems must be abandoned. The question is, naturally, which—the vacuum or the Westinghouse? Without at present discussing the relative advantages of either brakes, it is evident that the automatic vacuum has an immense advantage, as already the South Eastern stock, which is much more numerous than the London, Chatham and Dover, is fitted with this brake. The figures are:—

	Vacuum.	Westinghouse.
	S.E.	L.C. & D.
Locomotive	459	210
Coaching vehicles ...	2478	1240

Showing a proportion of over 66 per cent. of the whole already fitted with the automatic vacuum. Allowing the expense of fitting per vehicle to be the same for both brakes, on the question of expense the vacuum has therefore an immense advantage. To fit the the South Eastern rolling stock with the Westinghouse would therefore cost quite twice the sum required to fit the London, Chatham and Dover with the vacuum. To June 30th, 1898, the vacuum was fitted to 9,606 engines and 48,145 coaching vehicles, which ran 68,354,383 miles in the year, the faults giving

only one for every 429,807 train miles run. The Westinghouse was fitted to 3,279 engines and 20,168 coaching vehicles; the train miles run amounted to 29,978,768, and the faults to one in 145,528.

* * *

It will be of interest to compare the present agreement between the South Eastern and London, Chatham and Dover Railways with the heads of agreement for the fusion of the two systems arrived at by the two boards of directors on December 19th, 1876, which were as follows:—

The application to Parliament and the acceptance of the powers sought must be conditional on (1) the absence of any reduction of money earning powers beyond that involved in a reasonable equalisation of tolls, and (2) on the absence of injurious official interference in the management of the united companies.

If united the two companies (as one) would agree in the public interest:

1. To make return tickets available by each route.
2. To re-arrange the cross-country services so as to afford a reasonable amount of direct communication between the most important points.
3. To open out all the metropolitan stations of the two companies to all local stations in the united district.
4. To fill up the district between Maidstone, and Ashford and Chilham.
5. To make joint stations at Canterbury, Margate, and Dover.

As respects the Brighton Company—to offer the terms of last year—which involve the adhesion of the Brighton Company, if desired by them, and in the event of a fusion of South Eastern and London, Chatham and Dover, a division, for a long term, of competitive traffic between South Eastern, London, Chatham and Dover, and Brighton.

As respects the fusion of the South Eastern and London, Chatham and Dover, the principles should be:

1. A division of the total net profits from all sources, in agreed proportions.
2. New capital expenditure required to be made after the fusion, to be provided in those proportions; and
3. The fusion of capitals after an agreed period (say for 10 years), on the results shown by the division of net receipts.

Application to Parliament at the earliest period, not later than next year.

As an interim arrangement, all competitive traffic, not now divided, to be divided in the ratio of last year's receipts.

The proportions of division of net profit to be as follows:

	To the London, Chatham and Dover.	To the South Eastern.
	Per Cent.	Per Cent.
1st year of fusion	31	69
2nd year of fusion	31½	68½
3rd year of fusion	32	68
4th year of fusion	32½	67½
5th and following year of fusion	33	67

Management.—Boards of the two companies to remain until fusion of capitals, subject to reduction by death or resignation.

A Board of Management of five members to be appointed—three members to be nominated by the South Eastern and two members to be nominated by the London, Chatham and Dover—to carry out the objects of the fusion, and to be directly charged with the working and administration of the united lines and undertakings. The names are to be inserted in the Bill, and they are to remain in office for seven years, filling up vacancies by death or resignation out of the respective boards as above.

* * *

The present arrangements for which Parliamentary sanction are sought are:—The South Eastern to have 59 per cent. and the Chatham 41 per cent. of the profits. The chairman of the South Eastern to be chairman of the joint board, and a director of the London, Chatham and Dover to be deputy-chairman. Within one month from the passing of the Act, a managing committee is to be appointed, consisting of an equal number of the directors of the two railways, who are to hold office for three years. A South Eastern director is always to be chairman of the managing committee, and a London, Chatham and Dover director deputy-chairman; the meetings are to be held at intervals of not more than a month. Mr. J. S. Forbes is by section 18 appointed "general adviser of the joint board and managing committee, with power to attend and advise at all meetings of such board and committee, but without power of voting for or against any resolution." This is apparently an honorary position created for the chairman of the London, Chatham and Dover Railway, but it gives him no power to assist in the management of the railways. The following moneys are not to be brought into the joint account of the two companies:—The amount received by the South Eastern Company under an agreement between the London, Brighton and South Coast Railway Company

and the South Eastern Company, dated March 29th, 1877, and scheduled to the South Eastern Railway Act, 1877, and now entered on their half-yearly revenue accounts as "Proportion of Eastbourne Traffic," nor the receipts of the South Eastern Company included in the items entered in such accounts as "Rent and Hotel Accounts, etc.," "Transfer Fees," and "London, Brighton and South Coast Railway Company—use of lines between London and Redhill," nor the receipts of the Chatham Company included in the items entered in their half-yearly revenue accounts as "Transfer Fees" and "Rent of Property, etc., net," be so included or brought into account. The capital expenditure upon new works is to be provided by the two companies in the same proportion as the net receipts are divided, and this new capital is entitled to a preference dividend of 3 per cent. per annum before the profit is divided. If any question arises between the directors of the two railways who form the managing committee, the matter is to be referred to arbitration, and Lord Balfour of Burleigh is appointed standing arbitrator. The Continental traffic agreement is modified so as to bring it under the management of the joint committee. The new connecting lines between the two railways (for which Parliamentary sanction are sought in a separate Bill) are as follows:—At Chislehurst, Otford, Broadstairs, Margate, and Whitstable.

* * *

The recent disturbances at Edmonton and Liverpool Street Stations are but the logical sequence of the excessive generosity displayed for so many years by the Great Eastern Railway on behalf of the British workman. Upon every possible occasion the directors of the railway have alluded to the advantages they give to so-called working men. From the remotest antiquity to the present day history conclusively shows that whatever you give, as a favour, to such people is immediately seized upon by them as a right, and used as a lever for greater concessions. In the face of this knowledge it is not surprising that the travellers by the workmen's trains consider their patronage necessary to the success of the Great Eastern Railway, and acting on this belief have demanded further concessions, such as later trains at the absurdly cheap workmen's fares obtaining on that railway. It may be good policy to run these trains at early hours, and they may even assist the revenue, too; but, after all, why need railway

directors adopt the suggestions of Socialist agitators and notoriety hunters, and speak as if these so-called workmen were the only class to be catered for? "Sow the wind and reap the whirlwind." Sentiment aside, why should men calling themselves "workmen" be conveyed at a cheaper fare than others who undoubtedly do work, and that much harder than the so-called workmen. The former class earn better wages than numerous clerks and others, who have to keep up appearances, and yet we are asked to provide free railway travelling, free houses, free schools, old age pensions, and numerous other advantages, so that already (in many cases) overpaid men can have more money to spend with the publicans and betting men. Everyone is silent as to the undoubted claims of the small shopkeepers and lower middle class generally, to say nothing of struggling professional men. If concessions are to be granted, it is quite time the deserving people just alluded to are benefited; too much has already been done for the self-styled "working man." No doubt after these men have lost their money by "backing" horses, from information contained in the halfpenny papers, they feel quite ready to believe that they are hardly used, and swallow with avidity all the nonsense as to their rights that the wary editors, with their keen knowledge of human nature, for this purpose provide in other parts of the halfpenny "specials." After recent events railway companies will probably be less willing to pose as champions of the class of people styling themselves "working men."

* * *

Readers will be interested to have some information concerning the railway to Edmonton over which a few of the workmen's trains run, about which so much has recently been heard. There are several interesting features, the most prominent being the fact that, although so near London, the line is "single," being worked on the electric train tablet system, whilst fewer trains pass over it than on any other railway line within 20 miles of London. The branch leaves the (Cambridge) main line of the Great Eastern Railway at Angel Road Station, and proceeds on the level across country to Lower Edmonton; here, also on the level, it crosses the main highway to the North of England, while the station is practically built in the street, being surrounded by roads on all sides. The line was opened for passenger traffic as far back as March 1st,

1849, and was known as the Enfield branch, being the only railway connecting that town with the railway system of the country. It was for some time worked by the once popular Samuel's combined engine and train, named the "Enfield." (In Sekon's "Evolution of the Steam Locomotive" this train and its working are fully described.) On August 1st, 1872, the Great Eastern Railway opened the remaining portion of the line from Bethnal Green to Lower Edmonton, where it joined the existing line to Enfield, and since at that time the line from Copper Mills Junction (near Lea Bridge) to Hackney Downs Junction did not exist, and therefore all traffic from Angel Road to Bishopsgate Street was worked via Stratford, it is not surprising that the Enfield traffic ceased to work over the old single line to Angel Road. The new line is on a much higher level at Edmonton, so the original station above referred to is not used by the trains via Bethnal Green and the Seven Sisters branch. For these a station almost beside the old one was constructed, and is known as Lower Edmonton (High Level). The junction between the original Enfield branch and the newer line is a short distance north of Edmonton. Excepting the workmen's trains, there are only ten trains from and to the low level station at Edmonton, although no fewer than 164 call at the high level station daily. In 1891 a loop line was constructed from north of Lower Edmonton on the Enfield branch to Cheshunt, on the (Cambridge) main line, so that between Cheshunt and London the Great Eastern Railway have the choice of two distinct lines, with the numerous alternative routes which the various junctions and connecting railways on these lines afford.

* * *

The proposal of the South Eastern, Great Western, and Great Central Railways to acquire the District Railway appears to be taking definite shape.

There can be no doubt that access to the City would greatly increase the Great Western Railway's suburban traffic. The Company serves one of the best suburban districts, and because of its inaccessibility to the City it is as yet undeveloped. It is safe to say that Mr. Willis, the energetic General Manager of the South Eastern Railway, can also see advantages to be gained for his Company, or he would not entertain the scheme. The present close connections between the Great Western

and Great Central are probably the reason of the latter Company being included in the combination.

* * *

No wonder Sturrock's steam tenders did not succeed upon the Great Northern Railway. A man who was a fireman on the line at the time thus speaks of them:—"Then a change took place. I was asked by the shed foreman to do duty on a steam-roasting machine—oh, I beg pardon, I mean 'steam tender.' With all the extra work and anxiety attending the management of his double machine, only 6d. per day each man was allowed." It is superfluous to mention that this man is one of the bright and shining lights of a railwaymen's trade union. It is upon individuals of this calibre that the success or non-success of many important inventions that are introduced into railway working are dependent. If Mr. Sturrock had invented an apparatus to give the enginemen a pint of beer for every mile travelled, it would have been lauded to the skies by men such as the one we have quoted. The man received 6d. per day extra for any additional work necessary to coal an engine fitted with the steam tender, but apparently they preferred to idle their time rather than earn the extra money. How many extra shovelful of coal per day the steam tender required we do not know, but it is certain that the work of the firing of one of the engines so fitted was not nearly so arduous or incessant work as is now required to fire a big express locomotive, and no additional pay is given the firemen for doing their duty on these engines.

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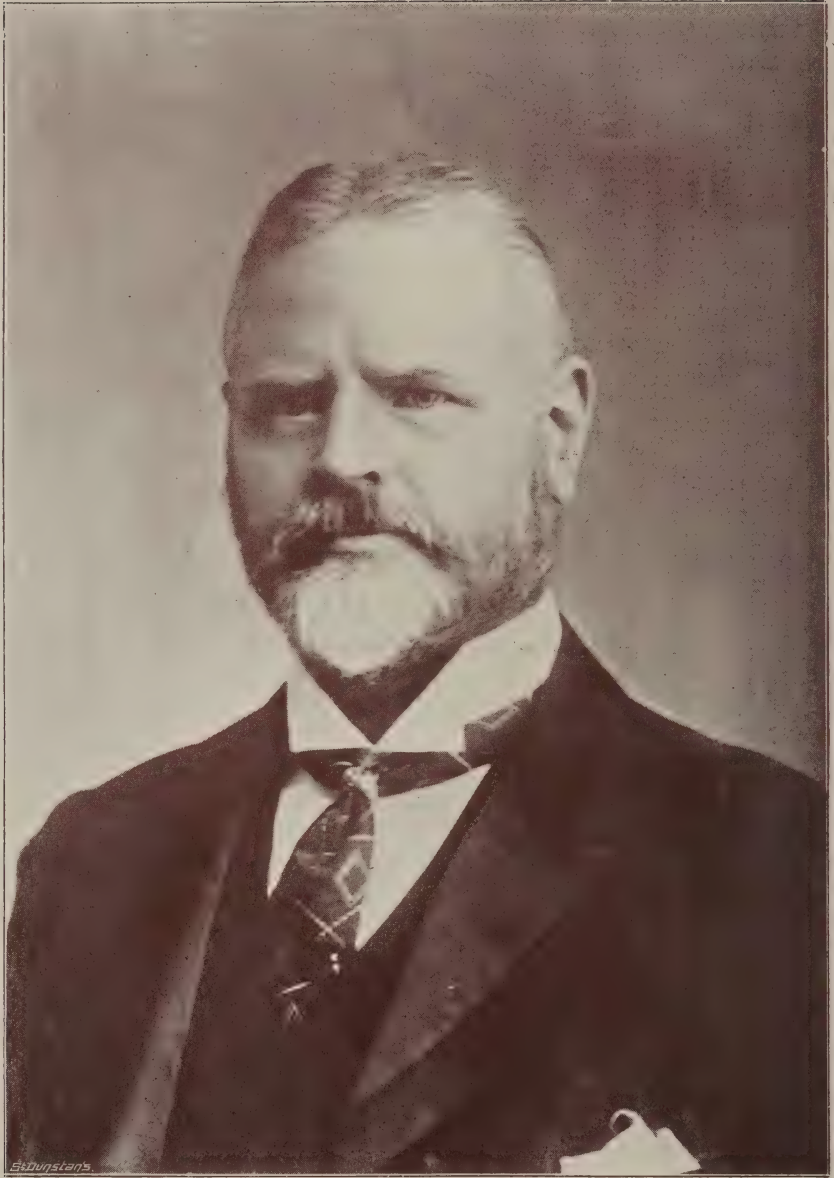
In our issue of November, 1897, we mentioned that the B. and O.R.R., evidently struck with the success of the RAILWAY MAGAZINE, had started a similar monthly periodical to advertise that railroad. We are glad to find that this American publication continues to flourish. However, in the January issue they are rather hard on our passenger coaches, an article headed "Glimpses from the Observation Car" commencing as follows:—"How little do our European

friends who have never travelled in America realise how little comfort, to say nothing of pleasure, they obtain in going from place to place in their horrid, cramped railway vans, which are practically without any of the necessary conveniences of an ordinary railway coach in our country. In England, at least, we wonder why the people do not urge improvement, as the railways there are not under Government control and are subject to the grumblings of the populace. The fault is with the people themselves, who are content, to a great extent, in following the footsteps of their ancestors." We rather fancy our railway managers would tell our B. and O.R.R. cousins that they have no lack of improvements suggested to them, but luckily most British railways pay a small dividend to the shareholders. If our general managers carried out all the improvements suggested to them, we fear our railways would soon follow the American fashion and be in the hands of receivers, instead of paying their way.

* * *

The great pressure on our space this month prevents us reviewing the "Railway Year Book for 1899" in this issue. But the publication has been enlarged and improved in several ways, and we can affirm that no publication dealing with railways has ever before been published with such a mass of information on the subject of railways. The particulars of running powers exercised by the railways is one of the prominent features in the current issue, the information supplied showing the name of the company over whose system the running powers obtain, between which points, the length, and whether for goods or passengers, or both. The number of the excellent historical accounts of leading railways has also been largely increased, and details given of Indian and Colonial railways. Judging by the demands that exist for Sekon's "Evolution of the Steam Locomotive," it appears as if those readers who require a copy of the "Railway Year Book for 1899" will have to order early, as the publication under no circumstances can be reprinted.





Wm. F. Sturges

THE RAILWAY MAGAZINE

APRIL, 1899

ILLUSTRATED INTERVIEWS

No. 22.—MR. WILLIAM POLLITT

General Manager Great Central Railway

“NOW that the public opening of the Great Central Railway’s extension to London is about to take place, it is, I think, Mr. Pollitt, an opportune time for travellers and others interested to be given some information concerning the Great Central system; but before discussing the London extension, which I believe I am right in describing as the goal towards which you have been working for many years past, an outline history of the original Manchester, Sheffield, and Lincolnshire line will, I feel sure, be appreciated by RAILWAY MAGAZINE readers.”

“Without entering into the many details, which, I fear, would lack interest to the public, it is only necessary for me to say that the position which the Company holds to-day in the railway world has not been attained without considerable strife and a correspondingly heavy expenditure before the numerous Parliamentary powers were obtained which enabled us to extend our ramifications to the great metropolis. Although 1846 was the year of the incorporation of the old Manchester, Sheffield, and Lincolnshire Company, including such old railways as the Sheffield, Ashton-under-Lyne and Manchester, the Great Grimsby and Sheffield Junction, the Sheffield and Lincolnshire Junction, the Sheffield and Lincolnshire Extension, and the Great Grimsby Dock Companies, the Manchester, Sheffield, and Lincolnshire

Company can really claim the year 1837—the year of the Queen’s accession to the throne—as the birth year of the principal portion of its system; and as an indication of the forward policy of the Company I may just say that within a very few years of its incorporation it had acquired by amalgamation, purchase, or lease, or had become part owners of, the following lines:—Manchester South Junction and Altrincham; South Yorkshire; Cheshire Lines; Marple, New Mills and Hayfield; West Riding and Grimsby; Manchester and Stockport; Manchester, Bollington, and Marple; Oldham, Ashton, and Guide Bridge; Trent, Ancholm and Grimsby; and to this list must be added the 111½ miles of canals owned by the Company.”

“I suppose, Mr. Pollitt, I am right in assuming that in the construction of the line between Manchester and Sheffield considerable difficulty was experienced?”

“That is so; the well-known tunnels at Woodhead, which penetrate a chain of hills known as the Pennine Range, and are situate some 19 miles from Manchester in a southerly direction, formed one of the greatest engineering works of the early days of railways, and to-day these tunnels still retain a high place in the list of the great works of this kind in the country. The tunnels are some 3 miles in length, and the first spadeful of earth of this great



undertaking was turned on October 1st, 1838, by Lord Wharnccliffe, the father of the present Chairman of the Great Central Railway. Some idea may be formed of the magnitude of labour involved in the construction when I tell you that, although a large number of men were constantly engaged upon it, the first tunnel could not be opened for traffic until the December of 1845, the second tunnel being commenced in the early part of 1847, and utilised for traffic on and from February 2nd, 1852. Owing to want of space, I fear I must not enter too fully into the 'ancient' history of the railway, as you will doubtless wish to hear something of what we have done for Grimsby."

"Yes, I should like to learn something regarding the docks at Grimsby, the resources of which, I understand, are likely to be greatly developed by the new extension to London?"

"Grimsby is now an important and rapidly increasing corporate town, and its position to-day as the largest fishing port in the world is entirely due to the enterprise of the old Manchester, Sheffield, and Lincolnshire, now the Great Central Railway Company, who have expended something like two and a half millions of money in the construction of the various docks, commodious warehouses, etc., resulting in the building up of a town which at one time promised to entirely die away. Nor do we regret having turned our attention to Grimsby; on the contrary, it has proved to be one of the Company's richest gathering grounds for traffic. On its most interesting past history I must not at present enter; suffice it to say, however, that the old town's progress has been so rapid as to be almost unprecedented. In 1790 the population, once nearly 10,000, had dwindled to 982 souls. Certain public-spirited individuals, however, seeing what a good port was in danger of being lost to the country, formed a private company with a view to improving the harbour. The

Manchester, Sheffield, and Lincolnshire Railway eventually purchased the rights of the old Dock Company, and since then, as already indicated, the town has risen by leaps and bounds, its population being now something like 60,000, and though a purely business town it is by no means devoid of interest to the pleasure-seeker. There can be no doubt that the chief glory of Grimsby lies in its docks and fish market, a visit to which would amply repay anyone. Although it would have afforded me much pleasure in supplying you with full details in regard to the vast property of the Company at Grimsby, I take it that the main object of your visit is to ascertain some particulars relating to our new trunk line. In passing I should, however, just like to say that the Company's docks alone cover a space of 103½ acres, in addition to which we own 340 acres of land in the immediate vicinity, upon which we have erected extensive warehouses, transit sheds, granaries, coal drops, etc., etc., all of which are equipped with the latest appliances for carrying on the enormous import and export traffic, and we are year by year adding to our possessions at this place. We have here, in addition to the coal drops, with their 15 spouts, each of which is capable of shipping coal at the rate of 200 tons per hour at a single spout, 41 fixed and portable hydraulic cranes, having a lifting capacity varying from 10 cwt. to 70 tons, together with a number of hand-cranes varying from 1 to 10 tons, thus providing facilities for the rapid loading and discharge of goods and produce which are unsurpassed by any other port. The great hydraulic tower which the Company has erected on the docks is the landmark of Grimsby, being 300 feet in height, and is a creditable example of British engineering skill. It was constructed to work the ponderous dock gates, the powerful cranes, and other appliances utilised for the loading and unloading of vessels, etc.; but the value of the power thus obtained can be



HARRY POLLITT, ESQ. LOCOMOTIVE ENGINEER



RHAIG BROWN, ESQ. SUPERINTENDENT OF THE LINE



J. G. JOHNSON, ESQ. ASSISTANT TO GENERAL MANAGER



J. G. JOHNSON, ESQ. ASSISTANT TO GENERAL MANAGER



E. G. JOHNSON, ESQ. ENGINEER



WILLIAM POLLITT, ESQ. GENERAL MANAGER



E. G. JOHNSON, ESQ. ENGINEER



C. T. SMITH, ESQ. GOODS MANAGER



R. M. L. JOHNSON, ESQ. COLLECTOR



T. PARKER, JR., ESQ. CARRIAGE & WAGON SUPERINTENDENT



F. WILLIAMS, ESQ. ACCOUNTANT

best appreciated by a sight of the docks and the ease and rapidity with which the operations of loading, etc., can be manipulated. I must not forget just to mention that we are extensively engaged in the Continental trade to and from the ports of Grimsby, Hamburg, Antwerp, and Rotterdam, and that we possess a fleet of 13 powerful steamers, with every convenience to ensure the comfort of passengers. Special goods and passenger trains are run in connection with these steamers to and from all parts of the Company's system. The special boat train, with passengers for the Company's steamers each evening, runs direct alongside the vessels, and all luggage is put on board by our servants free of charge."

"What of Cleethorpes?"

"Well, we have made Grimsby, and it is equally the fact that we have done the same for Cleethorpes.

Anyone who saw it a few years ago and sees it now will find little resemblance between the inferior little village and the smart-looking place to-day, with its fine promenade, elegant pier, and charmingly laid out gardens, due entirely to the judicious enterprise of this Company's directors."

"Thank you, Mr. Pollitt, for the information you have given me in regard to Grimsby, etc. Now I think the way is cleared for some particulars relative to the London extension. When did the present scheme regarding independent

access to London for your Company take definite shape?"

"As far back as 1873 the directors of the Company recognised the importance of obtaining access to London, and in conjunction with the Midland Company promoted a Bill for the construction of a series of joint lines with a view to securing access to St. Pancras Station. This was strenuously opposed, and although a part of the scheme was passed, the remaining portion—viz., between Melton Mowbray and Rushton—was rejected, and

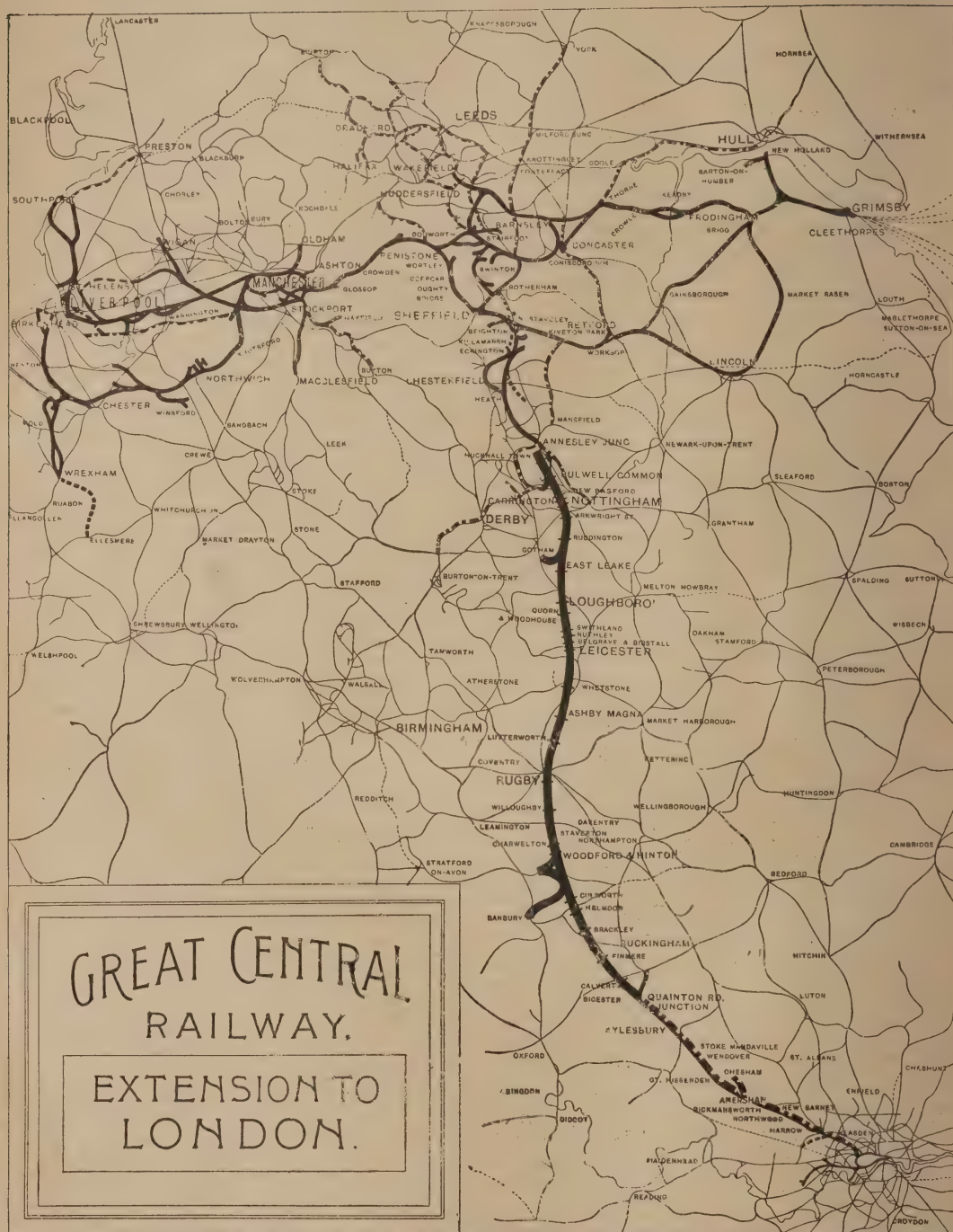


INTERIOR OF MR. WM. POLLITT'S PRIVATE OFFICE

the Midland Company thereupon decided not to proceed further with the Bill."

"Then at first you were not successful in obtaining Parliamentary sanction for your project. From whom did the chief opposition come, and what modification did you make before the scheme was accepted by Parliament?"

"I will lead up to your inquiry by stating that the rejection of the Bill of 1873, already alluded to, did not alter our determination to secure a larger share of profit from the traffic collected by us, and in 1888 we deposited a Bill of our own to



GREAT CENTRAL RAILWAY, EXTENSION TO LONDON.

REFERENCE

Great Central Railway

authorised or in course of construction.

Running Powers

Great Central Railway Extension to London

Running Powers from Quainton Road to London

acquire powers for the extension of our line in a southerly direction. The powers then sought were for a line from Beighton, a few miles east of Sheffield, to Chesterfield, serving a rich mineral district. This attempt was also unsuccessful, the opposition coming mainly from the Midland Company. In the following session powers were asked for a more comprehensive scheme—viz., a line from Beighton to Staveley and Chesterfield, and on to Annesley. The Midland Company again vigorously opposed the Bill, but it

was this time passed, receiving the Royal Assent on July 26th, 1889. The first sod was cut by the Right Hon. Earl Manvers on February 7th, 1890, and the line was opened for traffic in 1892. In 1891 the Company deposited a Bill for powers to construct a line 98 miles in length from Annesley to Quainton Road, whence access to London over the Metropolitan Railway was waiting. This was rejected. Powers were again sought in the following year, when a largely improved scheme was submitted which was strongly supported by various corporations, etc., and after a very

March, 1893, that the necessary authority to proceed with the scheme was secured. Contracts were let in September, 1894, the



THE BRACKLEY VIADUCT, LOOKING NORTH, ON THE EXTENSION TO LONDON, GREAT CENTRAL RAILWAY

first sod being cut in Alpha Road, St. John's Wood, on Tuesday, November 13th, 1894, by the Countess of Wharncliffe, the wife of the Chairman of the Company."

"Did you experience any difficulties in obtaining the finances for carrying out the work, Mr. Pollitt?"

"No, we had to wait a little time mainly in consequence of the great coal strike in 1893, which inflicted such a heavy loss on the Company's revenue."

"I believe that in addition to the new line opening up a large tract of country at present unprovided with railway facilities, the extension places many important towns formerly on branches on a direct line to London?"

"Yes, that is so, many of the places have hitherto been devoid of railway facilities."

"Are the distances between London and the various towns you will serve favourable as compared with the existing route?"

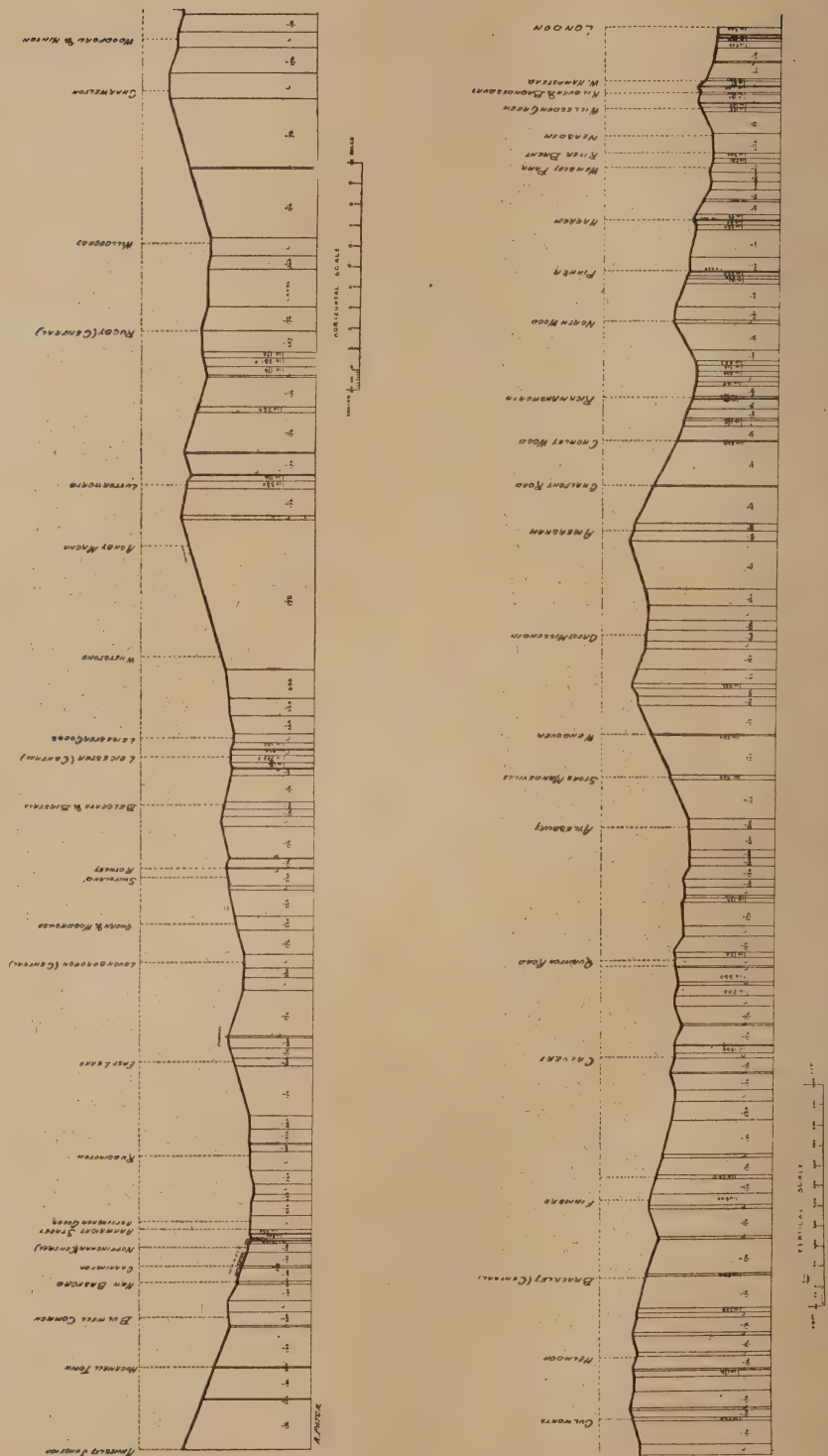
"Yes, distinctly so; in fact they are less in some cases than at present exist."

"As to the engineering works on the London extension, some of these were of



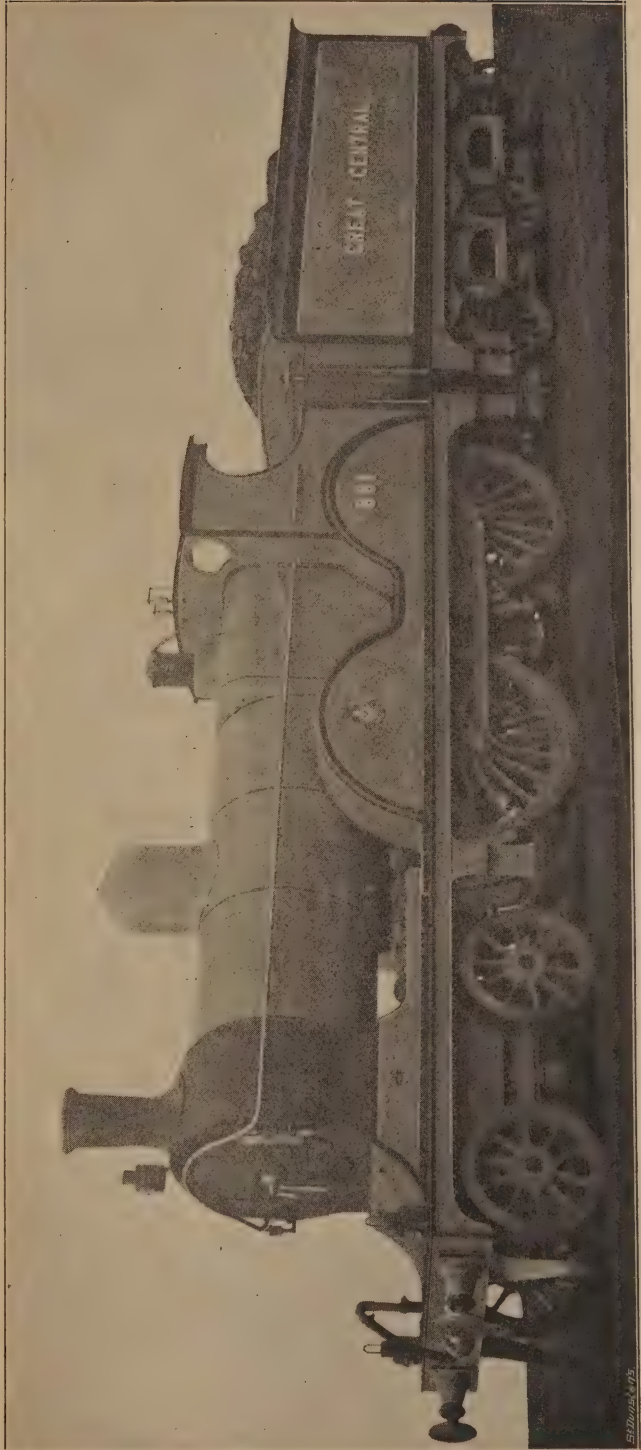
THE HELMDON VIADUCT ON THE EXTENSION TO LONDON, GREAT CENTRAL RAILWAY

severe contest the Bill was passed by both Houses of Parliament, but before the Royal Assent could be obtained a dissolution took place, and it was not until the end of



a very heavy character, I believe, Mr. Pollitt?"

"Yes, such was the case. The Bulwell Viaduct, situate about three miles north of Nottingham, is 360 yards in length, and has 26 arches. A steel bridge for four sets of rails passes over the River Trent at Nottingham, and 60 arches and bridges carrying the line through the heart of Nottingham, as well as three tunnels—viz., the Sherwood Rise, Mansfield Road, and Weekday Cross tunnels, 600, 1,188, and 230 yards in length respectively. A bridge over the Midland Railway, Nottingham, has a single span of 170 ft. The line is carried through Leicester on arches and steel girder bridges extending for a distance of upwards of a mile. A steel bridge, 600 ft. long, carries the railway over the London and North Western Company's main line at Rugby. Catesby Tunnel, 10 miles south of Rugby, is 3,000 yards long, lined with brickwork, and is inverted throughout, the thickness of the lining varying from 3 ft. to 1 ft. 10½ in. The ventilation of the tunnel is effected by means of five perpendicular shafts from the brow of the arch to the open air placed at intervals along its length. The time taken to construct the tunnel, from the



TYPE OF FOUR-COUPLED BOGIE EXPRESS ENGINE

Designed by Mr. H. Pollitt, M. Inst. M.E., M. Inst. C.E., to work Passenger Trains on the London Extension of the Great Central Railway (for dimensions, &c., see p. 300)



A CORRIDOR TRAIN BUILT FOR THE LONDON TRAFFIC, GREAT CENTRAL RAILWAY. (For particulars see page 303)

commencement to completion, has been two years and two weeks, and taking the length of the tunnel into consideration it is claimed that this establishes a record. Brackley Viaduct, Northamptonshire, 310 yards long, 180 ft. high, has 22 arches. A tunnel under Lord's Cricket Ground, and heavy cut-and-cover work in St. John's Wood, whilst the goods warehouse, Marylebone, constructed of brick and steel work, 384 ft. long by 355 ft. wide, is one of the largest buildings of the kind in the country. Such are some of our engineering works."

"What about the gradients and curves on the London extension—are they severe?"

"No, on the contrary, they are exceptionally easy, and some very fast running will be accomplished on the new line."

"Will you please give me some particulars of the stations?"

"We have provided stations at the following places on the new line, all of which have been constructed on the 'island' platform principle excepting Carrington and Arkwright Street, Nottingham:—Hucknall Town, Bulwell Common, New Basford, Carrington, Nottingham Central, Arkwright Street, Ruddington, East Leake, Loughborough Central, Quorn, and Woodhouse, Swithland, Rothley, Belgrave and Birstall, Leicester Central, Whetstone, Ashby Magna, Lutterworth, Rugby Central, Willoughby, Charwelton, Woodford and Hinton, Culworth, Helmdon, Brackley Central, Finmere, Calvert, and London (Marylebone). The 'island' platform principle has many advantages, as in the event of its becoming necessary to widen the line this can be done without interfering with the station buildings. The largest stations on the line are those at Nottingham, Leicester, and London. At Nottingham there are two large "island" platforms, each about 1,300 ft. long and 68 ft. wide, with two bays at each end for local traffic. General waiting, etc., and refreshment rooms have been placed upon each platform; the booking offices, par-

cels offices, etc., being situated near the entrance to the station in Mansfield Road. A large handsome hotel will shortly be built adjoining Nottingham Station, and this, it is anticipated, will meet a long-felt want, the hotel accommodation in that town having hitherto been notoriously inadequate for so large a place. At Leicester the station will comprise one large 'island' platform, 1,240 ft. long, with bays at each end, and there are on the platform general waiting rooms, refreshments rooms, etc. The

arch into a covered courtyard. The courtyard is similar in many respects to that of the Grand Hotel, Paris, but is very much larger, while it has the addition of a terraced footway on either side, the shrubbed parterre in the centre giving much the effect of a winter garden or promenade. The *tout-d'ensemble* of the whole hotel, is one of which the contractors for the entire decorations and furnishing—Maple & Co., Ltd., of London and Paris—may well be proud. I



EXTERIOR OF LONDON ROAD STATION (MANCHESTER), GREAT CENTRAL RAILWAY

passenger station at London (Marylebone Station) is 1,000 ft. long by 435 ft. wide, and covers an area of about nine acres. One of the finest hotels in Europe has been erected in front, facing Marylebone Road. The building is in red brick with light terra-cotta dressings, and is surmounted by a lofty clock tower which can be seen from a great distance. In form it may be described as quadrangular, and is entered on the south from the Marylebone Road through a lofty vaulted

should here state that on July 25th last the line was sufficiently completed to allow of the running of mineral traffic, and this has had the effect of consolidating the banks and testing the strength of the bridges."

"I notice you are bringing the principal word in your title, 'Central,' well to the fore in naming your stations in several towns. I presume these stations are in the centre of the towns, and not, as is often the case on other lines, situate on the outskirts?"

"The 'Central' stations have been erected as near to the centre of the towns as was practicable, and in the case of Nottingham this is right in the heart of the town, and close to the market place."

"Thank you. What about the locomotives and rolling stock? I believe you are introducing several new features into the design of your carriages?"

"To meet the demands created by the

tors have desired to attain, and in this respect they have been undoubtedly successful, as the coaches are of a most handsome and luxurious character, and replete with everything requisite to ensure that comfort which is so essential in long-distance journeys. The following particulars will be of interest:—The latest type of standard engines designed and adopted by this Company's Locomotive Engineer (Mr. Harry Pollitt) are *bogie*



INTERIOR OF LONDON ROAD STATION (MANCHESTER), GREAT CENTRAL RAILWAY

opening of the new line the directors have spent over a million and a quarter of money in providing new locomotives of the best and most powerful type, carriages, saloons, corridor trains, goods and coal wagons, and the other descriptions of vehicles necessary for dealing with the various classes of railway traffic. The carriages have been designed with a view to meeting in every possible way the comfort of the travelling public, this being one of the principal features which the direc-

express engines with 4,000 gallon tenders, six-wheels coupled goods engines, also with 4,000 gallon tenders, four-wheels coupled passenger tank engines, and six-wheels coupled goods tank engines. Of the express engines, 20 are working, and 19 others are in course of construction. They were specially designed for working the express passenger service between Manchester and London. The fire-box is of what is known as the 'Belpaire' type, which is now the standard for all this

Company's locomotives. The advantages of this form of box are that the heavy girder stays on the crown are dispensed with, and light wrought-iron vertical and transverse stays are substituted, thus enabling the incrustation liable to form in any fire-box to be kept down to the lowest possible minimum by being able to wash out from the sides and back any dirt that may have settled. For the heavy gradients it is necessary that steam as dry as

on the left of the fire-box back. The cylinders are $18\frac{1}{2}$ in. diameter, by 26 in. stroke. In these engines the old-fashioned slide valves are replaced by what are known as 'piston valves' fixed below the cylinders, and by means of which the wear and tear on the link motion is, on account of the small amount of friction, reduced to a minimum, with, of course, a corresponding reduction in fuel consumption. There is



INTERIOR OF VICTORIA STATION (SHEFFIELD), GREAT CENTRAL RAILWAY

possible only should be used, and for this purpose a large dome is placed on the boiler, with steam-pipe leading to the cylinders. The boiler and fire-box shell plates are of Siemens-Martin mild steel, and the inside fire-box of copper, which is fitted with a long fire-brick arch and a deflector plate. The working pressure of the boiler is 170 lb. per square inch, and the water is fed into it by two Gresham and Craven's self-starting injectors, a No. 8 on the right hand side and a No. 9

also fitted the ordinary 'Stephenson' link motion, with cast-iron eccentrics working on cast-iron pulleys. The front end of the engine is carried on a bogie with pivoted centre, which has four wheels 3 ft. 6 in. diameter, to allow for the easy taking of curves. The driving and trailing wheels are 7 ft. diameter, and the wheels of the tender 4 ft. 3 in. All the wheels are of cast-steel. The driving-wheels, if made of wrought-iron, as was the practice a few years ago, would re-

quire about 110 pieces, and consequently as many welds, which cannot all be got perfect, but in using steel this is entirely obviated. The tyres, axles, and crank-pins are of Siemens-Martin steel, also the slide-bars. The tender holds 4,000 gallons of water, takes five tons of coal, and is carried upon three pairs of wheels and axles. The brake is the well-known vacuum automatic. The weight of the engine is carried upon laminated springs on the bogie and 'Timmis' springs under the driving and trailing wheels, with Messrs. Spencer Moulton's assistant bearing springs under the 'Timmis' springs. The tender springs, it will be noticed, when loaded, are quite

at present working on long-distance goods trains) have also a 4,000-gallon tender, similar in every respect to those attached to the express engines, and the remarks already made in regard to the boiler, fire-box, motion, etc., apply in this case. The cylinders are $18\frac{1}{2}$ in. by 26 in. stroke, with steam-chest and valves on top, actuated by a rocking shaft carried from brackets fixed to the slide-bar bracket and coupled to the ordinary 'Stephenson' link motion. The diameter of the wheels is 5 ft. 1 in., and Messrs. Gresham and Craven's sanding apparatus is fitted to operate in front and back of the driving-wheels. The engine is carried upon laminated springs at front and back, and



BRIDGE CARRYING THE GREAT CENTRAL RAILWAY (EXTENSION TO LONDON) OVER THE TRENT AT NOTTINGHAM

straight without any 'camber.' The usual intermediate side-buffers between engine and tender are not employed, and in their place is fitted one large central spring resting in two castings one on the engine and the other on the tender. This arrangement is found to effectually prevent any loose or jerky motion between the engine and tender. It reduces flange friction, and entirely obviates leaky feed-water connections. Messrs. Gresham and Craven's steam-sanding apparatus is fitted to operate in front of the driving-wheels. The total length of engine and tender over buffers is 53 ft. $10\frac{1}{4}$ in., and weight in working order $89\frac{1}{2}$ tons. *The goods tender engines* (of which 66 are

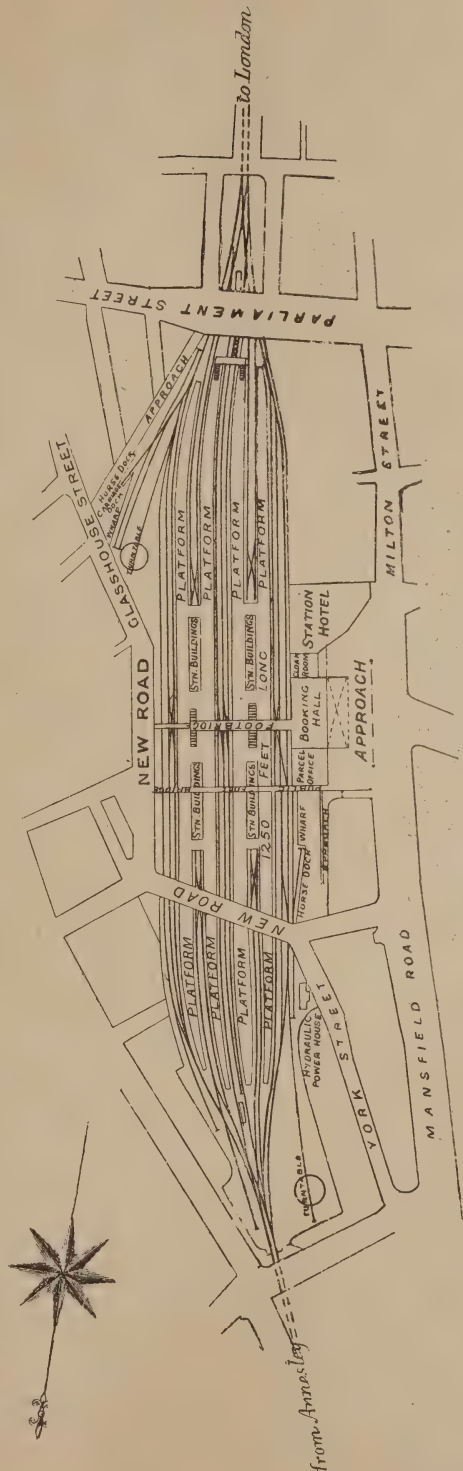
'Timmis' springs are under the driving-wheels. The length of the engine and tender over buffers is 51 ft. $0\frac{3}{8}$ in., and the total weight 85 tons 6 cwt. *Of the passenger tank engines*, 10 are working suburban traffic. The cylinders are 18 in. diameter by 26 in. stroke. The boiler, fire-box, brake, etc., are similar to those already mentioned. The diameter of the wheels is 5 ft. 7 in., and the front and hind ones are fitted with a radial axle-box, to allow the necessary movement for rounding curves easily, and also with laminated springs, the driving and trailing wheels having 'Timmis' springs. The tanks carry 1,400 gallons of water, and the bunker 50 cwt. of coal. The weight of

the engine is 59 tons, and the total length over buffers is 37 ft. 5 $\frac{5}{8}$ in. Seventy-four of the *goods tank engines* are running short-distance heavy goods trains, and 25 are still under construction. The details as regards boiler, fire-box, motion, etc., are exactly the same as given in other cases, but the cylinders are 19 in. diameter. The coupled wheels are 5 ft. 1 in. diameter, and the engine is fitted with a radial axle-box at the hind end. Under the driving and trailing wheels are 'Timmis' springs, and laminated springs under the leading and radial. It carries the same amount of water and coal as the passenger tank engine. The total weight is 59 tons 18 cwt.

"Then Mr. Harry Pollitt, our Locomotive Superintendent, is now building some very large 'single-wheelers' for the London extension. They will have 7 ft. 9 in. drivers, and cylinders 19 $\frac{1}{2}$ by 26, like the latest Midlands. But they will have the great advantage of huge boilers, with about 1,750 sq. ft. of heating surface, and 200 lbs. steam pressure.

"Then in regard to the carriages, Mr. Pollitt?"

"Each of the new express trains, constituting the latest additions of the Great Central Railway stock, will be composed of corridor vehicles. The carriages rest upon four-wheeled bogies, and are fitted with Gould's vestibule and automatic coupler, Gresham's direct system of heating, torpedo ventilators, the automatic vacuum break, electric communication between passengers and attendants, together with passenger communication apparatus with the driver and guard in connection with the automatic brake, and every effort has been made to reduce oscillation to a minimum. The first-class Dining cars, third-class Dining cars, and the Kitchen cars are lighted by electricity; and, in addition to the usual lights, one can be placed over each dining table; the rest of the vehicles are lighted by oil-gas with Coligny lamps. The first-



GROUND PLAN OF THE JOINT CENTRAL STATION (NOTTINGHAM), GREAT CENTRAL RAILWAY

class Dining cars are 50 ft. long over platforms, each providing accommodation for 20 passengers. The internal fittings are sumptuous and finished in rare woods, upholstered in figured plush, and embellished with works of art; the roofs are beautifully decorated in gold and colours. The seats and tables are placed at the sides, with a passage down the centre, the seat-heads being of Spanish mahogany,

relieved with proof etchings, whilst the doors of these compartments are beautifully inlaid with marquetry of most artistic design. Another car is finished mostly in olivewood, but exactly of the same design, which is part Chippendale and part Adams'. There is also one finished in mahogany of Adams' and Queen Anne style. The third-class Dining cars are externally of the same design, with the

exception that they are 47 ft. 6 in. over platforms. The interiors are finished in light oak and light and brown oaks. As in the first-class cars, alcoves are placed above the tables, as well as electric light and communication, with brackets for holding glasses, bottles, etc. The ends of the compartments are finished to match, and relieved with photographs placed over seat-backs. The roofs are covered with lin-crusta, carefully picked out and decorated. These cars provide accommodation for 36 passengers, and are constructed with clerestory roofs, having stained-glass lights. The platforms at ends are finished inside and outside with bevelled-edged glass doors, and the whole of the side-lights are of bevelled-edged glass in teakwood frames. The lavatories are placed at ends, and are fitted with Jennings' water-closets and Beresford's wash-basin, with dado finished in mahogany or teak-



INTERIOR OF BUFFET CAR OF CORRIDOR TRAINS,
GREAT CENTRAL RAILWAY

wood match-boarding, and the walls covered with emdeca. A space is also provided for hand-bags, etc. The Kitchen car, which is placed between the first and third class Dining cars, is 47 ft. 6 in. long, and will, by means of the connecting gangways, serve both classes of passengers. In addition to the Kitchen and attendants' compartments, a special feature of this car is that it possesses two first-class private

relieved with exquisite carvings, fretwork, and satinwood raised panels, and bordered with Coromandel wood. Over each table is placed the electric communication, and above are alcoves fitted with bevelled-edged mirrors and brackets for holding glasses, bottles, etc. A hat-rack is provided over each seat-back, and an umbrella-rack to each seat-head. The ends of the compartments are panelled, moulded, and carved to match, and re-



THE RIGHT HON. C. T. RITCHIE, PRESIDENT OF THE BOARD OF TRADE, DISPATCHING THE FIRST TRAIN FROM THE MARYLEBONE TERMINUS, GREAT CENTRAL RAILWAY, AT THE FORMAL OPENING ON THURSDAY, MARCH 9TH, 1899

STANDARD

Dining compartments. The cooking is done by means of a gas range, and the kitchen is furnished with all the necessary utensils, crockery, glassware, cutlery, refrigerators, etc. The corridor carriages are externally of one uniform height and design, their length being 46 ft. 6 in. over ends, each being divided into compartments with side corridors, which are lighted by large plate-glass lights, protected by neat brass hand-rails. The

floors of which are inlaid with mosaic tiles and the walls covered with pegamoid and matchwood dado; they are also fitted with a Jennings' water-closet, Le-vick's wash-basin, water-bottles, towels, and everything that is necessary for the toilet. The interiors of the compartments are trimmed in morocco, moquette, terracotta, cashmere, velvet, and green cloth, finished in mahogany, and decorated with photographs of places of interest on the



EXTERIOR OF THE MARYLEBONE TERMINUS, GREAT CENTRAL RAILWAY

first-class carriages are finished in figured Spanish mahogany relieved with gold. The ends of the corridors are framed, panelled, and moulded in the same rich wood and adorned with bevelled-edged mirrors and splendid carvings. In the corners are placed filters for the use of passengers, and at the entrance to vestibules are hung beautiful doors with bevelled-edged glass panels. Leading from the corridor at each end are placed ladies' and gentlemen's lavatories, the

Company's system. The third-class carriages are of similar design, except that they are finished in polished teakwood, with lincrusta panels and dado. The compartments are fitted with spring seats and backs, with arm-rests trimmed in rep, the door panels with Vulcan cloth, and they possess all the comforts above-mentioned.

"All carriages are provided with portable tables placed at ends of corridors, which can be readily fixed in position



INTERIOR OF THE MARYLEBONE TERMINUS (LONDON), GREAT CENTRAL RAILWAY

and in any compartment as desired. In all cases the electric communication between passengers and attendants is immediately placed over each seat back, and in the corridors are placed alarm signals for the use of passengers in case of emergency. The whole of the floors are covered with figured cork matting, and a rug is furnished in addition to each first-class compartment. The buffet cars are externally of the same length and design, and consist of a spacious buffet, with

all utensils. The difference as between first-class and third-class carriages, it will thus be seen, is but one of degree, passengers enjoying throughout perfect equality in all respects affecting their comfort and welfare. As the train speeds along they can enjoy the ever-changing panorama of the landscape from the windows of the side corridors extending over the whole length of the trains. Moreover, the monotony of the journey will be pleasantly relieved by refresh-

ments served from the buffet and kitchen cars, with a *cuisine* that would do credit to many a leading hotel. By means of the connecting gangways the attendants will also be enabled to supply passengers with tea, coffee, etc. A new feature in these carriages is that they are externally painted, the upper panels French grey and the lower panels brown, varnished and picked out with gold lines,



INTERIOR OF BOOKING HALL, MARYLEBONE TERMINUS, GREAT CENTRAL RAILWAY

kitchen, three third-class compartments, attendants' compartment, and lavatory. The buffet is magnificent, being panelled and moulded in figured Spanish mahogany, and relieved with proof etchings and bevelled mirrors. The roof is covered with lincrusta, specially designed with a border picked out in gold. The compartments and lavatory are furnished and fitted exactly the same as the thirds already described. The attendants' compartment is completely furnished, and also the kitchen, which has a gas range and

lettered and emblazoned with the Company's coat of arms. The whole of the carriages have been carefully designed by, and built under the direct supervision of Mr. T. Parker, jun., the Company's Carriage and Wagon Superintendent."

"Such arrangements should certainly attract a considerable traffic to your system?"

"Yes; we have taken every advantage of the experience of other railway companies, and the new line will, I feel sure,

compare most favourably with any of the railways which have years run to the Metropolis."

"Have you in view any projects regarding through services to and from the Southern and Western lines?"

"In addition to the construction of the extension to London line, the Company are now making a branch line, $8\frac{1}{2}$ miles long, leaving the new railway at a point just south of Woodford and Hinton Station to Banbury, which will give access to the Great Western Company's extensive system."

"Before leaving this section of the interview, Mr. Pollitt, have you anything to add. My questions may have missed some interesting points?"

"I might say that powerful hydraulic plant has been provided for dealing, in an effective way, with the traffic at Nottingham, Leicester, and London, and provision has been made for lighting the passenger, goods, and coal stations at these places



EXTERIOR OF HOTEL GREAT CENTRAL, MARYLEBONE, GREAT CENTRAL RAILWAY

by electricity, as well as the sorting sidings at Annesley, Woodford, and Neasden, and a most liberal provision has been made for dealing with the future development of the traffic—a very large area of land having been acquired at all the stations, etc.”

“Of course all the lines to the North and Midlands will feel the effects of the new route. What towns now served by the London and North Western and Midland Railways will be most benefitted by the opening of the Great Central Railway London extension?”

“Nottingham, Loughborough, Leicester, Lutterworth, Rugby, Brackley, Manchester, Sheffield, etc.”

“Now, Mr. Pollitt, a biographical outline of your own successful career will be most interesting.”

“I have been with the Company since the year 1857, and some twelve years afterwards was appointed Accountant, which position I held until 1885, when I was appointed Assistant General Manager, and was made General Manager, vice the late Mr. Underdown, in January, 1886.”

“Then as to the Great Central officers, will you give me a short account of the professional career of your assistants?”

“Our Secretary, Mr. Oliver S. Holt, came to us from the Lancashire and Yorkshire Company, and after a varied experience in the Goods Manager’s and this office was appointed to his present position in 1892. Mr. Frank Williams, the Company’s Accountant, joined the service so long ago as 1864, in the department of which he is now the head, he having been appointed to his present important position in 1886. Mr. C. A. Rowlandson, who was appointed Chief Engineer on February 1st, 1897, on the retirement of Mr. Alexander Ross, gained considerable experience in his profession under the well-known engineer, Sir Douglas Fox,

he having also been the Resident Engineer of the important works connected with the London end of our new line, and also the Engineer to the Mersey Railway Company. Mr. R. Haig Brown, the Superintendent of the Line commenced his railway career with the London and North Western Company in 1867, was transferred to the service of this Company in 1873, and after a very varied experience was appointed to his present position in 1888. Mr. Harry Pollitt, the Locomotive Engineer of the Company, received his training in our large engineering works at Gorton, and has a very intimate knowledge of the requirements of the Company, and after having control over the shops of that place received the appointment he now holds some five years ago. Mr. Charles T. Smith joined the service in 1868, and after a thorough training in railway work was appointed Chief Assistant to my predecessor, the late Mr. R. G. Underdown, which position he occupied until 1885, when he was made Goods Manager. Mr. Edward Watkin entered upon his career in the service of this Company in the year 1871, and after an all-round training was appointed Mineral Manager in 1887. Mr. Thomas Parker, jun., was appointed Carriage and Wagon Superintendent in 1894, he having served his apprenticeship in the shops of the Company at Gorton.”

“I must thank you most heartily, Mr. Pollitt, for the trouble you have taken to enlighten the readers of the RAILWAY MAGAZINE regarding the Great Central Railway. I know it will be greatly appreciated by them.”

“And I must in turn thank you for the patient hearing you have given me, and express the hope that your popular Magazine will continue in the way it has begun, and meet the success it so well deserves.”

G. A. SEKON.

HOW THE RAILWAYS DEAL WITH SPECIAL CLASSES OF TRAFFIC

IV.—Flowers and Vegetables from West Cornwall and the Scilly Isles

By VICTOR L. WHITECHURCH



IN the early days of railways we are told that a certain Company carefully sheeted their coal trucks because they were ashamed of such a low class of traffic. Since then, however, we are accustomed to look at the "mineral" traffic of our railways as being a branch of the greatest importance, and the shareholder cares little whether

world render the traffic in them temporary and special. My remarks will be confined to one railway—the Great Western, and to one district only of that railway, viz., West Cornwall. I shall divide the subjects into two heads—Flowers and Vegetables.

Flowers. Who is it says there is nothing tender and romantic about our iron roads? Look at the bunch of deli-



Gibson & Sons] [Photo, Penzance
UNLOADING THE S.S. "LYONNESSE," AT PENZANCE, WITH FLOWERS FROM THE
SCILLY ISLES

coals are sheeted or not so long as strikes do not stop their transit altogether.

But the mineral traffic of a railway is not all, and I have already referred in a former article to the traffic drawn from another kingdom—the "vegetable." It is my intention now to describe that traffic in a little more detail. It naturally comes under the general heading of "How the Railways deal with Special Classes of Traffic," because it is obvious that the different seasons of the vegetable

cate Narcissi by the side of the sick bed, or dropped hastily as a love-token after the mazy dance, or worked into a cross and sadly laid upon the cold form of the dead. The railway has had a share in it all. Away, out of the drowsy West, bathed by the warm Gulf Stream, through the darkness of the night, trains have been speeding to the heart of the world—London, or to the smoke-begrimed cities of the Midlands, carrying those blossoms that gladden the eyes and freshen the

hearts of thousands who receive them as a message of the coming Spring, while Winter still holds sway.

The "flowers of the West" hail from two principal districts, the Scilly Isles and the region round about Penzance, the former being by far the more productive of the two. The climate of the Scilly Isles might almost be described as "tropical," chiefly owing to the great influence which the Gulf Stream exerts upon them, and they are, therefore, admirably situated for the cultivation of flowers which blossom many weeks earlier than in England. Far and away the chief of these flowers are

goods train, so that they are made on the spot. Wall Flowers can be packed very tight, but the other varieties need careful and light handling.

Although the Great Western Railway quotes and receive through rates from the Scillies, the carriage from there to Penzance is performed by steamers belonging to the West Cornwall Steamship Company. These boats leave Scilly about 10 a.m., reaching Penzance in something like four hours.

The transit to London is, *as a rule*, effected by the 4.50 p.m. mail ex Penzance, which reaches Paddington at 4 a.m. the next morning.

The flowers are conveyed in the ordinary brake-vans, an extra one being often attached for the purpose. It is not necessary to provide a special vehicle. It must be remembered also that flowers are conveyed at passenger rates.

But frequently it happens that in the height



[Gibson & Sons]

[Photo, Penzance

TRANSFERRING THE FLOWERS TO THE FLOWER SPECIAL AT
PENZANCE STATION

the Narcissi. Gladiolas and Wall Flowers, however, are also grown, and the latter abound round Penzance.

Now it is of the utmost importance that flowers, like fish, should be delivered in London or the northern cities in time for the early morning markets, and the Great Western Railway contracts to do this without fail. The flowers are gathered in the Scillies in the early morning, and packed in light, non-returnable wooden boxes, which are made up into packets of five boxes. The wood to manufacture these is, by the way, sent down, cut into thin planks, from London to Penzance by

of the season an extra load of flowers arrives from the Scillies too much to carry by the mail train. In this case one or more specials have to be despatched, although all profit is lost as soon as the Company are forced to have recourse to them. But their contracts must be maintained. If over 10 tons of flowers are to be despatched a special is generally necessary.

The running of these specials is no easy task, especially when it is borne in mind that the line from Penzance to Plymouth is at present nearly all single. Strict injunctions are laid down that all

cattle, goods, and mineral trains are to be kept clear of the "Flower Specials," while in cases where a *stopping* passenger train on the double line is likely to cause much delay to a flower train, such passenger train may be shunted to allow the flower train to pass, provided that little delay is likely to occur to the passenger train by so doing; and on the single line in cases where it is seen that a *serious delay* can be prevented at a crossing-place by *slightly* delaying a passenger train, the flower train is to be given the preference.

These specials, when run, precede the mail train, and regulations are arranged for the running of three of them, if necessary. And three "Specials" running with only 75 minutes intervals between first and last over the greater part of the Great Western main line represents no little amount of care in the working of the traffic.

The following is an abridged outline of the running of "Flower Specials" *when necessary*.



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[Photo, Penzance

"STILL THEY COME"
LOADING A "FLOWER SPECIAL" AT PENZANCE STATION

"FLOWER SPECIALS."—SEASON 1899.

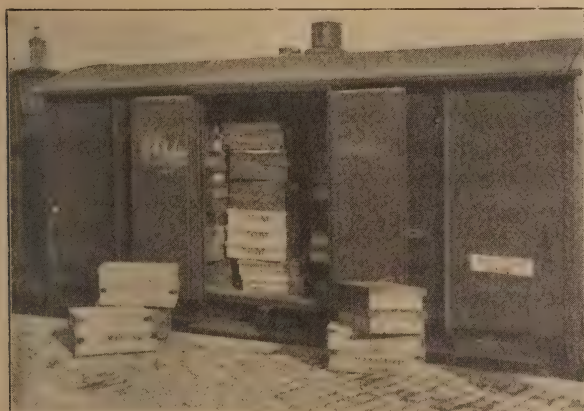
STATIONS.	No. 1.		No. 2.		No. 3.	
	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.
	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Penzance	—	4. 0	—	4.15	—	5.15
Truro	5. 5	5.10	5.20	5.25	6.26	6.31
Burngullow	5.33	5.36	—	—	6.53	6.56
Lostwithiel	Each train stops here to take in water.					
Plymouth (North Rd.)	7. 1	7. 6	7.23	7.40	8.35	8.40
Newton Abbot	8. 5	8.10	8.55	9. 0	9.45	9.50
Exeter... ..	8.53	9. 5	9.48	9.55	10.38	10.45
Taunton	10. 0	10. 8	10.45	10.53	11.35	11.43
				A.M.	A.M.	A.M.
Bristol (Temple Meads)	11.22	11.32	11.58	12. 8	12.48	12.58
	A.M.	A.M.	A.M.			
Swindon	12.42	12.50	1.18	1.25	2. 5	2.15
Didcot	1.30	1.45	2. 4	2.30	2.55	3.10
Paddington	3.15	—	3.50	—	4.30	—

But by no means do all the flowers which leave Penzance find their way to Covent Garden. A large proportion go to Manchester and Birmingham, and any one who is at all familiar with the latter city will have noticed how readily flowers are disposed of there by the street sellers.

In the case of Manchester the transit is effected *via* Bristol and the Severn Tunnel, the consignment either being detached from the mail train, or from one of the above "Specials" at Bristol, from which the train conveying it starts at 1.5 a.m. and arrives at Manchester at 5.50.

The Birmingham traffic is conveyed *via* Didcot, by a train leaving that station at 3 a.m. and arriving at Birmingham at 5.15.

Although the Scilly Islands



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[Photo, Penzance

A VANLOAD OF FLOWERS FOR LONDON

flowers occasionally find their way into other cities, London, Manchester, and Birmingham are their principal destinations. The "season" for them may be roughly stated as being from January to Easter.

The following is a list of the number of tons of flowers conveyed from Penzance by the Great Western Railway during the last few years:—

Year.	Tons.
1894	381
1895	293
1896	514
1897	480
1898	296

It will be seen that there is a consider-

47 tons being conveyed from Scilly in 1897, and 51 tons in 1898.

When we turn to the vegetable traffic of the Great Western Railway we raise a larger subject for discussion than that of flowers. Our minds naturally revert to "Jersey potatoes," but it is not with Jersey that this article deals, but only with West Cornwall. Half a century ago the traffic in that district would have been chiefly mineral. To-day the mines about Redruth are nearly all closed, hundreds of the miners have emigrated, and the industry



[Gibson & Sons]

[Photo, Penzance]

READY TO DEPART
THE FLOWER SPECIAL AWAITING THE "RIGHT AWAY" SIGNAL AT PENZANCE

able falling away during the past two years. This is said to be accounted for by the fact that the soil of the Scilly Isles has been so taxed with the production of flowers that it has seriously deteriorated. A problem, therefore, has to be solved—the problem of restoring life to the soil by the right species of manure, and, for the sake of the islanders, it is to be hoped that something will be done to ensure a return of such a crop as that of 1896.

During the last two years, however, a small traffic has sprung up in tomatoes,

of that part of the country is the gentler agricultural work of growing broccoli and potatoes. Perhaps the latter vegetable has a certain claim to be grown by the Celts of Cornwall, in that it was first introduced by Sir Walter Raleigh into Ireland, the kindred home of the Celt.

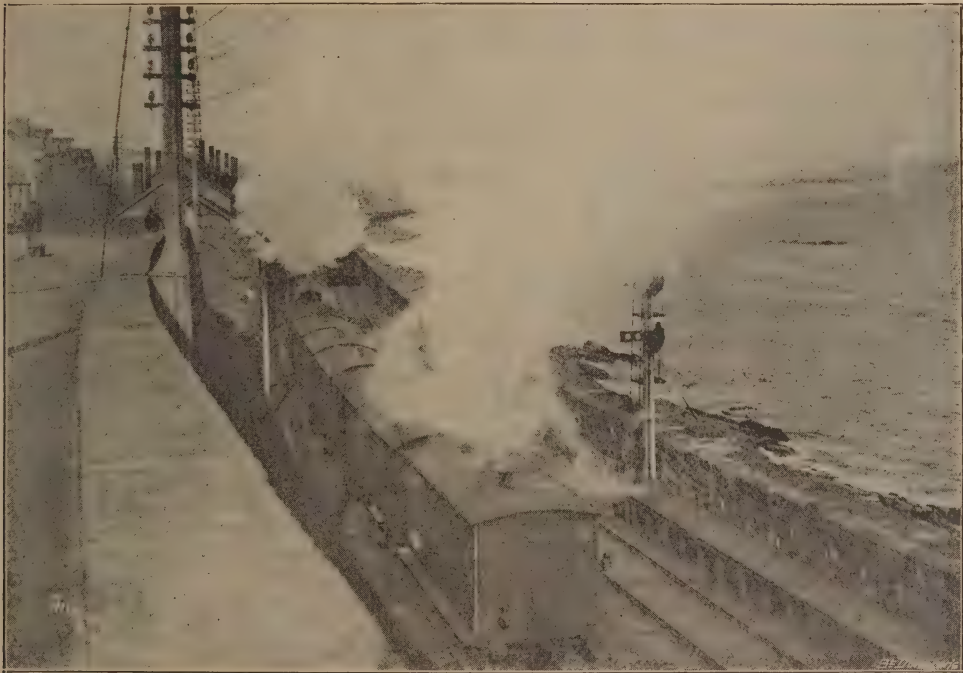
The broccoli and potato producing area lies around Penzance, Marazion, and St. Erth, where acre upon acre of ground is devoted to the cultivation of these vegetables, and employment found for many hands. The season for broccoli comes on

in December. They are conveyed by goods traffic, the heads being packed lightly in crates, which weigh when full only about a hundredweight, and the truck-loads of these crates sheeted over, not from the sense of shame before alluded to, but for protection.

Nearly the whole of the broccoli traffic is worked by special goods trains running either as far as Didcot, or *via* that station to Bordesley Junction (Birmingham), for it is a curious thing that most of these Western broccolis find their way up North, and very few to the London markets. If any

The following are the outline runnings of the broccoli specials :—

STATIONS.	No. 1.		No. 2.		No. 3.		No. 4.	
	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.
	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Penzance	—	1. 5	—	3. 0	—	1. 55	—	5. 0
Truro	5.18	5.28	7.13	7.25	6.44	6.55	8.22	8.32
Plymouth	8.40	8.50	10.50	11. 5	9.40	—	11.10	11.30
Exeter	11.15	11.30	A.M.	A.M.	—	A.M.	A.M.	—
	A.M.	A.M.	1.30	1.45	—	1.55	2.10	—
Swindon	4.20	4.35	6.30	7. 5	—	7. 0	7.20	—
Didcot	5.30	—	8. 5	—	—	8.15	10. 0	—
Oxford	—	—	—	—	—	10.25	10.40	—
Bordesley Junction	—	—	—	—	—	2. 0	2.40	—
Birmingham ...	—	—	—	—	—	2.49	2.50	—
Market Drayton ...	—	—	—	—	—	5.25	5.35	—
Crewe	—	—	—	—	—	6.30	—	—



Gibson & Sons]

THE 4 P.M. FLOWER SPECIAL LEAVING PENZANCE STATION

[Photo, Penzance

reader of the RAILWAY MAGAZINE should meet a train on the Great Western Railway carrying as its engine head-signals an “S” under the smoke-stack, and a white diamond on a black ground over the middle of the buffer-plank, or, by night, a green light over a white, five chances to one it is a “broccoli special.” I say these odds advisedly, because fish, meat, parcels, and new potato specials carry the same signals.

If there is any traffic for London it is worked on from Didcot by the first available train, but should the 1.5 p.m. ex Penzance contain six or more trucks for Paddington it is extended from Didcot as follows :—

Didcot, dep.	6.0 a.m.
Paddington, arr.	8.5 „

Any broccoli for South Wales is taken off at Bristol, and worked *via* the Severn Tunnel.

It might be interesting to note the maximum loads of these broccoli specials:—

Penzance to Plymouth ...	19	wagons and van
Plymouth to Exeter ...	29	„ „
Exeter to Bristol... ..	35	„ „
Bristol to Didcot... ..	33	„ „

Sometimes it is necessary in heavy seasons to run two trains to the North from Didcot. The station masters at Penzance, Marazion, St. Erth and St. Ives have to see that a sufficient supply of wagons is always on hand to deal with this important traffic. Arrangements are made for the quickest possible return of the empty trains, which are confined strictly to empty trucks, and are not allowed to do any local work on the

“travels by train,” and, therefore, reads the RAILWAY MAGAZINE.

I have only given the merest outlines of the work done in order to ensure the broccoli being brought to its destination in order to always maintain the usual market value. I might add that sheeting the goods is a protection against the great enemy to this vegetable—frost.

I give herewith the amount of broccoli dealt with, in tons, for the last five years in this district (including some shipped from the Scillies):—

1894	5,483	tons
1895	4,436	„
1896	3,685	„
1897	5,159	„
1898	5,978	„

The large increase in the last two years should be noted.

With regard to the new potato traffic from the same district I need not enter into so many details, because very much the same arrangements apply to this “special traffic,” as to that just dealt with. The earlier potatoes are packed in hampers, later on sacks serve to hold them during transit. Here, again, the greater



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[Photo, Penzance

TRANSFERRING THE BROCCOLI TO THE SPECIAL TRAIN AT
PENZANCE GOODS STATION

journey. The most careful instructions are issued for the crossing of up full or down empty specials on the single line between Penzance and Plymouth, and the work *en route* at every point. All exertions are made to ensure the specials keeping time. Shunting operations at stations must be suspended in good time to allow them to pass, and ordinary goods, coal, and mineral trains must in all cases be kept well clear of the trains conveying broccoli traffic. In fact, the regulations for working this one species of traffic from this one special district form a pamphlet that would astonish many a man who

amount of traffic goes north *via* Didcot, or *via* Bristol and Severn Tunnel, and three “conditional” potato specials are arranged to run to those stations from Penzance when required, briefly as follows:—

	No. 1. p.m.	No. 2. p.m.	No. 3. p.m.
Penzance, dep.	2.30	5.0	6.45
Bristol, arr.	4.10	5.55	7.10
„ dep.		6.10	7.25
Didcot, arr.		8.50	10.35

If there is any London traffic it is worked forward from Didcot by the first available train, or if there are six or more trucks the train is extended to Paddington.

The Northern traffic is sent forward by Conditional Express Goods Train to Crewe from Didcot, which train as it speeds on its way conveys this produce of the far West for the markets of Manchester, Liverpool, Leeds, Sheffield, Stockport, Bradford, Halifax, aye, and even beyond the borders into Glasgow, etc., etc.

The regulations for ensuring punctuality and return of empty trains, etc., etc., are much the same as those applying to the Broccoli traffic.

That this traffic is very considerable may be gathered from the following figures, representing the potato produce of the Penzance district only, conveyed by Great Western Railway in the last five years:—

	Tons.
1894 ...	9,007
1895 ...	8,694
1896 ...	12,821
1897 ...	11,112
1898 ...	12,395

I have been trying to show in the above notes not only something of the means by which the Great West-

ern Railway grapple with this special kind of traffic, but also to illustrate the value of the Railway to the agriculturist. Many years ago, when the mines of Western Cornwall were in working order, copper and tin could be taken by boat—as was the case—to the market; but it would have been of not the slightest use to have attempted such an industry as that of flowers and broccoli, for without the railway such goods could never reach the market in time. It will be interesting in the future to see whether the advent of Light Railways will do the same for various agricultural districts that the Great Western

is doing for West Cornwall. Some years ago many agricultural producers were advocating the providing of special “farm produce trains” by the Railway Companies, and in the traffic we have been considering we have seen how well the Great Western has come forward with such farm produce trains. The question of railway transit and railway rates in connection with farm produce is a very interesting and rather complicated one. It may be remembered that a conference was held at Paddington in 1896 to discuss the subject, and Viscount Emlyn then pointed out some of the difficulties with which the Company had to contend. It had been stated that they gave advan-



[Gibson & Sons]

[Photo, Penzance

LOADING A BROCCOLI SPECIAL AT PENZANCE GOODS SIDINGS

tages to foreigners, but “foreign competition appeared to have gained its footing by adapting and applying itself to giving those who had to carry goods the goods in large quantities and packed in a convenient form, so that they might be carried and handled cheaply.” He then went on to point out how much easier it would be to deal with farm produce if the farmers themselves would combine in sending their goods, and so ensure sufficient quantities, well packed, in which case rates could be reduced. He cited instances of agriculturists who had done this with successful results. It is, undoubtedly, this method of combination which would help the

farmer in his pocket by saving of rates, and which would also help the Railway Companies in their arrangements for carrying the traffic. It was very aptly remarked by the Hon. A. B. Bathurst at the conference above referred to, that he did not agree with a certain speaker who claimed that the farmer's sole duty was to farm; it was his duty to learn business as well as farming.

to call his neighbours together, and see if between them they could not combine several truck loads of the same species of goods where alone they would only find a desultory half a truck each. They would find the Railway Company, I fancy, ready to meet them, and the Company would rejoice in having its traffic simplified, for what is often wanted is the establishment of "a system of combination for dealing



"2428"—A SIX-COUPLED GREAT WESTERN ENGINE ENGAGED IN HAULING THE "SPECIALS" FROM PENZANCE

At all events it may be pretty conclusively seen that without the "Broccoli" and "New Potato" specials the Cornish farmer would find little market for his produce, and that it is the *quantity* exported that enables the Great Western to provide such "specials," and to charge their present rates. In districts where the farmer cannot provide such large quantities for transit, it would be well for him

with articles in bulk instead of in small quantities."

In a future article I hope to give some notes relating to the strawberry traffic from the West.

The photographs to illustrate this article have been specially taken for the purpose by Messrs. Gibson and Sons, "the leading photographic establishment in the West," Penzance.

RAILWAY LITERATURE

"A MANUAL OF LOCOMOTIVE ENGINEERING."

[By W. F. Pettigrew, M. Inst. C. E.,
M. Inst. M. E. London: Chas. Griffin
and Co., Ltd.]

This work, upon the preparation of which Mr. Pettigrew, the Locomotive Superintendent of the Furness Railway, has been engaged for some time past, is now issued. To describe the work as "a manual" leads one to expect a handbook rather than the massive tome of over 400 pages, with nearly 300 illustrations, that the author presents to his readers.

The volume opens with an historical account of the development of the steam engine, commencing with Cugnot's machine of 1769, and concluding with the "Lady of the Lake," of 1862. This portion of the book is but a mere outline—only occupying 25 pages—and is therefore disappointing, as a somewhat fuller account of the evolution of the steam locomotive would doubtless have been greatly appreciated; but as Mr. Pettigrew merely describes the chapter in which the history is contained as an "historical introduction," under the circumstances, we cannot expect greater detail—much as we should like it.

The second chapter treats of "Modern Locomotives—Simple." After explaining the meaning of such technical terms as adhesion, tractive effort, and boiler power, the author proceeds to describe the last type of London and South Western Railway outside cylinder express passenger engine, built under the *régime* of Mr. W. Adams. Although it is not generally known, and no hint is given in the book that such was the case, we think it right to place on record that Mr. Pettigrew, who was for some years the Works Manager at Nine Elms, was, at the time these engines were built, the locomotive superintendent of the railway in everything but name, and there is no doubt that to Mr. Pettigrew belongs the honour of de-

signing this excellent type of engine. There is a comprehensive plate of this engine, with an exhaustive index thoroughly explaining every part. Eight other similar plates are also given, illustrating other well-known types of locomotives, whilst almost every style of "Simple" modern express (and many tank) engines are also described and illustrated. The third chapter treats of compound locomotives, the various parts of which are fully detailed. Mr. Pettigrew has also prepared a table from experiments made with compound engines, and the results, as shown, will probably very greatly surprise engineers and others who believe so ully in the efficiency and economy of the compound locomotives. For instance, with an actual boiler pressure of 160 lbs., the theoretical mean pressure in the high pressure cylinder is given as 79.5 lbs., whilst the actual pressure is only 42 lbs. In the low-pressure cylinder the discrepancy is still greater, the theoretical being 40.5 and the actual as low as 20 lbs. Then the horse power developed in the high and low pressure cylinders is actually only 169.7 and 166.6 respectively, against the theoretical pressure of 319 and 339. The total actual horse power being but 336.3, when the theoretical is given as 658.

Mr. Pettigrew shows that with a boiler pressure of 175 lbs. the theoretical gain from compounding is only 18 per cent., the actual gain must therefore (upon the basis of the table just quoted) be very considerably less. Unfortunately the author does not give his own opinions upon the various disputed points of locomotive practice; the undoubted value of his "Manual" would be considerably increased had Mr. Pettigrew published his personal views on several interesting points about which controversies frequently arise.

On the other hand, however, the author has prepared several new tables and diagrams from data obtained from personal experiments; they relate to train resistance,

due to gravity, velocity, heating surface, etc., and are notable and useful as being dependable conclusions adapted to modern locomotive practice; in several instances the old formulæ are shown to be erroneous.

The book, being written for professional locomotive men, is necessarily of a technical nature, such important subjects as balancing, valve gears, the framing, smoke-box, fire-box, lubrication, and other matters that form portions of the curriculum of a locomotive engineer being carefully and minutely discussed; whilst all necessary tables and methods of calculating the various stresses, strains, dimensions, etc., are fully detailed. Chapter XXII. is an important one, dealing as it does with the repairs, running, inspection, and renewals of locomotives; whilst Appendix B—which is a table giving the complete dimensions, 125 in number, of no less than 40 types of present day British locomotives—will not only be of use to the professional reader, but will supply others interested in the railway engine with all necessary particulars concerning most of the existing classes of engines at present in use on our railways. Appendix C is a condensed comparison of the leading dimensions of British or foreign locomotives. Whilst, as previously intimated, “A Manual of Locomotive Engineering” is essentially a work for the professional locomotive engineer and student, the book contains much that is not only of interest, but of use to the great number of our readers who take an intelligent interest in the marvels of the railway steam engine.

Mr. Pettigrew's well-known practical and scientific knowledge of the matters upon which he has written are sufficient guarantee that the work contains all that can be learnt from a book upon such a subject. Anyone digesting the contents of the volume would have a perfect theoretical knowledge of locomotive designing, build-

ing, and management, and a training under Mr. Pettigrew would give him the practical experience necessary to produce the perfect locomotive engineer. Mr. Pettigrew is to be congratulated upon his book, and we have no doubt it will at once rank as the standard work upon this important subject. The published price is one guinea; not a high price, perhaps, considering the importance of the subject and the amount of matter contained in the book, but, we fear, sufficiently expensive to prevent the extensive sale that such an important work deserves. Two chapters, one on American and another on Continental locomotives, are contributed by Mr. A. F. Ravenshear, B.A., of the Patent Office.
G. A. SEKON.

*“THE RAILWAY YEAR BOOK,
1899.”*

[London: The Railway Publishing Co.,
Ltd.]

This monster shillingworth of information on every phase of the railway world is now in the hands of the public.

Judging by the eulogistic reviews showered upon the “Railway Year Book” last year, one would have been quite contented had the new volume been merely brought down to date. But the Editor evidently was not satisfied with such a policy, the consequence is that the 1899 edition contains many new features. We have not space to refer to the extensive additions and improvements that have been made; but we may say that, despite condensation, the size of the book has increased from 219 to 286 pages, while the price remains one shilling. The publishers tell us that the edition of many thousands is nearly exhausted, so that those readers who have not yet obtained a copy of the “Railway Year Book” for 1899, must purchase quickly if they wish to obtain the volume.

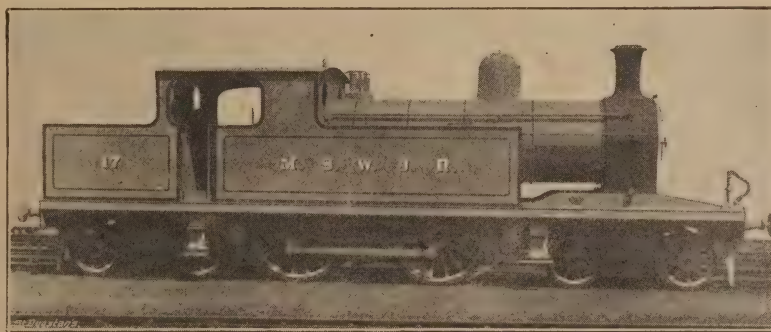
FROM CHELTENHAM TO ANDOVER BY THE MIDLAND AND SOUTH WESTERN JUNCTION RAILWAY.

BY P. A. LUSHINGTON

IN the hope that I might arouse some interest in a line of railway which is perhaps little known to many of the readers of the RAILWAY MAGAZINE, but which doubtless will some day be of very considerable importance as a direct route from Southampton and Portsmouth to the North of England, I ventured to address myself to Mr. Sam Fay, the General Manager of this Company, for a few details about this railway, which I hope may prove interesting to the readers of the RAILWAY MAGAZINE.

The idea of a direct north-to-south route, passing over the Cotswolds and through North Wilts, is no new one. So long ago as 1845 Stephenson projected a railway through this very district, under the title of the "Manchester and Southampton Direct." The idea was killed, however, at the time of the mania, and no steps were taken to connect Cheltenham and Andover by railway until, in 1872, the local landowners projected a railway between Andover and Swindon, with a view to joining up the South Western and Great Western systems. This line was opened in 1882. It was known as the Swindon, Marlborough, and Andover Railway.

A year before the opening of the Andover and Swindon line a company was formed for carrying on the railway from Swindon to Cheltenham, under the title of the "Swindon and Cheltenham Extension Company." In 1884 these two Companies were amalgamated into the "Midland and South Western Junction Railway Company." The affairs of the Company got into a very bad state, and, in consequence of the non-payment of the debenture



'No. 17,' A NEW TEN-WHEEL TANK LOCOMOTIVE, MIDLAND AND
SOUTH WESTERN JUNCTION RAILWAY

interests, a receiver in Chancery was appointed. From that time until the opening of the line to Cheltenham, in 1891, matters went from bad to worse; but at the end of 1892 a change for the better took place, and, matters mending rapidly, in 1897 the receiver was discharged, all liabilities having been met, and the interest on the first debenture stock has since been paid. The fact that during the past five years the traffic receipts have increased 73 per cent., with only 18 per cent. increased expenditure, shows the great strides the Company has made.

Running powers are exercised by the Company over the London and South Western Railway between Andover and Southampton Docks, the engines and trains of the Midland and South Western Junction Railway running right through, and through carriages are run daily between Bradford, Leeds, Sheffield, Derby, Birmingham, and Southampton, and also between Cheltenham and Portsmouth.

Not only does this Company claim to

holiday to try this country, which is certainly somewhat out of the beaten track.

Starting from Cheltenham, the scenery for the first $7\frac{1}{2}$ miles is exceedingly fine as we ascend the Cotswolds. At one point, just beyond Charlton Kings, we pass on our left the reservoir, with a beautifully-wooded hillside behind it; whilst on our right the hills tower above us, from the top of which a splendid view may be had of Cheltenham and the Valley



THE MIDLAND AND SOUTH WESTERN JUNCTION RAILWAY "SOUTH EXPRESS" IN CIRENCESTER STATION

be the shortest and cheapest route from Southampton to the North, but it also claims to be the most picturesque, and undoubtedly the scenery along this line is in many places very beautiful, and delightful expeditions may be enjoyed from various points along the route. A short mention of some of the beauties of the route and the various points of interest which this railway has made accessible will, I hope, induce some people who seek "fresh fields and pastures new" for their

of the Severn as far as the Malvern Hills, which are clearly visible on a fine day.

At Andoversford we reach the summit of the Cotswolds, having attained an altitude of about 1,000 feet. Here we leave the Great Western branch line to Chipping Norton, over which we have been running, for the Midland and South Western Junction Railway proper. Before reaching the pretty village of Chedworth, we pass through some beautiful woods, the property of Lord Eldon. In

these woods the most perfect remains of a Roman villa are to be seen. The credit of the discovery of these remains must be given to the rabbits, who brought to the surface a few cubes of tessellated pavement, and so led to the excavation of the site. Lord Eldon has covered over the remains, and has also built a museum, containing a very fine collection of pottery and coins, which may be inspected by permission.

After a run of about three-quarters of an hour we arrive at Cirencester, a town

Town, and soon arrive at Marlborough. From here, again, some delightful expeditions may be arranged, chief among them being through Savernake Forest, with its grand avenue of beech trees. Another expedition may be made to Avebury, with its wonderful avenue of stones, and Silbury Hill, the largest tumulus in Europe, being 170 feet in height and 2,000 feet in circumference.

From Marlborough to Savernake, the railway skirts Savernake Forest on the left, whilst on the right the fine Hill of



VIEW OF SWINDON (TOWN) STATION AND OFFICES OF THE MIDLAND AND SOUTH WESTERN JUNCTION RAILWAY

dating back to ancient British times. Cirencester may well be made a centre for many expeditions. The town itself is very interesting, with its fine old church and old-fashioned market-place. Among the many beautiful drives which may be taken from here are the drives through Oakley Park (Lord Bathurst's) to the Sapperton Vale; to Fairford, famous for the stained glass in the church windows; and to the Seven Springs, the reputed source of the Thames. Leaving Cirencester, we pass Cricklade and Swindon

Martinvale, from which a splendid view may be obtained, attracts attention. From Savernake to Andover the line runs past Collingbourne Ducis, Ludgershall, and Weyhill (famous for its fair), affording fine views of Salisbury Plain on the right.

The line itself is "single" throughout, with the exception of a section from Marlborough to Grafton, which was opened on June 26th, 1898. Formerly the Midland and South Western Junction Railway ran over the Great Western

branch line from Savernake to Marlborough; but this arrangement not proving satisfactory a company was formed, under the title of the Marlborough and Grafton Company, to make a line from Marlborough to Savernake, and also to double the existing line from Grafton to Savernake.

The management of the Marlborough and Grafton Company is identical with that of the Midland and South Western Junction Company, the necessity for a separate company being formed being due to technical difficulties connected with the affairs of the Midland and South Western Junction Railway.

This new line enables the Company to



THE MARLBOROUGH TUNNEL ON THE NEW MARLBOROUGH AND GRAFTON RAILWAY

work their trains much more smartly now that they are independent of the Great Western Railway; whilst the gradients on the new line from Marlborough to Savernake are much easier than those on the Great Western Railway branch line. Yet, on the whole, the Midland and South Western Junction Railway is a hard line, the first seven miles and a half out of Cheltenham being very steep, the gradients in several places being as much as 1 in 70 and 1 in 72, whilst at the same time there are several, very sharp curves. From Rushey Platt Station up to Swindon Town the gradient is severe, whilst between Swindon and Marlborough the curves are somewhat sharp

To give the reader some idea of the actual working of the trains and the difficulties they have to contend against as to punctuality, I append the log of two journeys I have taken recently over the Midland and South Western Junction Railway:—

SOUTH EXPRESS.

	Booked time.	Actual time.
Cheltenham ... dep.	2.52 p.m.	... dep. 3.0

NOTE.—Midland train late, then five minutes' stop for Cheltenham train to pass.

	Booked time.	Actual time.
Cirencester.....dep.	3.35 p.m.	{ arr. 3.45 dep. 3.47
Swindon Town arr.	4.2	...arr. 4.11
Swindon Town dep.	4.5	...dep. 4.18
Marlborough...dep.	4.31	{ arr. 4.43 dep. 4.45
Andover Junc...arr.	5.10	...arr. 5.20

NOTE.—North Express had to be waited for. Two minutes' stop at Ogbourne for goods train.

NORTH EXPRESS.

	Booked time.	Actual time.
Andover Junc...dep.	3.0 p.m.	...dep. 3.1
Savernake.....dep.	3.29	...dep. 3.34½
Marlborough...dep.	3.41	...dep. 3.46
Swindon Town arr.	4.3	...arr. 4.7½
Swindon Town dep.	4.5	...dep. 4.12
Cirencester.....dep.	4.33	...dep. 4.40
Cheltenham ... arr.	5.10	...arr. 5.17

NOTE.—Stop two minutes at Weyhill for Andover train.

This is not bad work for a single line with plenty of traffic on it. (I may mention that it is worked on the tablet system.)

If proof were needed of the enterprise displayed by this Company, it would be supplied by a glance through their "Time-table and Tourist Guide" for July, August, and September—a book of some forty pages, giving full information as to cheap excursions. Combined rail and coach trips are arranged for parties of not less than six, full information concerning which may be obtained from the General Manager. Every Saturday morning, too, an

express is run from Cheltenham (connecting with the Midland expresses from the North) to Southampton, for the convenience of passengers going by the American and Cape line steamers. Special tourist fares are issued from the principal stations on the line to all parts. No doubt the policy pursued by Mr. Sam Fay will result in an ever-improving financial position.

Hitherto, one of the chief difficulties with which the Company has had to contend has been the fact that, owing to the Midland and South Western Junction Railway running over the Great Western Railway for $7\frac{1}{2}$ miles near Cheltenham, and $6\frac{1}{2}$ miles between Marlborough and Savernake, the latter Company has had the rates in its own hands. The Marlborough and Grafton new line has got rid of part of the difficulty; the passing of the Andoversford and Stratford-on-Avon Railway Bill would have to a large extent got rid of the other part.

In the present Session powers are being

For the future the prospects of the line are bright. Increased traffic receipts, an improved train service, the great develop-



THE MIDLAND AND SOUTH WESTERN JUNCTION RAILWAY
MILITARY PLATFORM AND SIDINGS AT LUDGERS-
HALL (SALISBURY PLAIN)

ment of Southampton as a port recently, and latest of all, the formation of a military camp on Salisbury Plain for autumn manœuvres, the stations for which are Ludgershall and Weyhill, will assuredly increase the prosperity of the Company. During the late manœuvres the Com-

pany entrained some 26,000 troops. The Midland Company are also seeking Parliamentary powers to run over and use the line throughout. Last, but not least, in Mr. Sam Fay (to whose courtesy I am indebted for much of the information contained in this paper) the Company possesses an enterprising General Manager, to whom much of the credit for the improved position of the Company is due. Mr. Sam Fay has now been General Manager and Secretary for about six years. Previous to that he was for a con-



PRIVATE SIDING FOR THE OGBOURNE RACING STABLES

sought for a line from Andoversford to Ashchurch, there to join the Midland system without troubling the Great Western.

considerable number of years at Waterloo, in the service of the London and South Western Railway.

JUBILEE OF THE FIRST SECTION OF THE WAVERLEY ROUTE

(The Story of the Hawick and Carlisle Route)

BY ROBERT COCHRANE



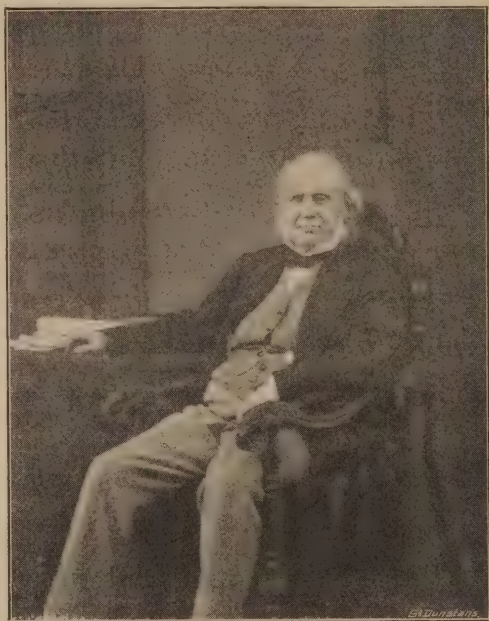
THE Charlotte Brontë, who was in Scotland in 1850, the very names of Melrose, and Abbotsford, and Dryburgh, as they have to many another

traveller, possessed music and magic. Yet the very man who was mainly the source of much of the music and magic, while rearing the most prosaic of all his romances—that one in stone and lime at Abbotsford—would have been glad of the services of the railway as a matter of convenience, and for the improvement of his estate, passed away in 1832, before a sod had been cut of a much-talked-of Border Railway in which, as we will see, he was much interested, and did something

to promote. The first section of the Waverley route, opened just fifty years ago, gave connection from Edinburgh to Hawick, a distance of 53 miles, with some of the richest and most romantic scenery of the Borderland. Besides Melrose, Abbotsford, and Dryburgh, on the main route, there are now branches, which from Galashiels to Selkirk give access to the vales of Yarrow

and Ettrick, renowned in tradition, poetry, and song. The Peebles line from Galashiels follows the vale of Tweed to that town, and then circles in over Leadburn Moor again to Edinburgh. Earlston, with its memories of Thomas the Rhymer, and the Broom of Cowdenknowes, is ap-

proached by the Duns branch from St. Boswells Junction. When Frances Kemble, the actress, was at Earlston in 1847, she had to drive 23 miles, till within 14 miles of Edinburgh, ere she touched a point at which she could avail herself of the railway. The thriving towns of Galashiels, Hawick, and Jedburgh are now within less than an hour's ride from Edinburgh by fast train, and pilgrims journey thither from the ends of the earth to visit



MR. JOHN MILLER, C.E.
Engineer of the "Waverley Route," North British Railway.

the Land of Scott.

The route, by vale of Gala, through this notch in the Lammermoors, was little used before the beginning of the century, owing to the marshy nature of the ground, and the number of marauders in the district. The coach route was mainly by Pathead and Blackshiels, over Soutra Hill to Kelso and Jedburgh. The present

EDINBURGH TO HAWICK

HAWICK BRANCH

GRADIENT PROFILE

Gala Water road is very tortuous, winding round all the faces of the hills and hollows on the east side of the valley, in order to preserve the level. At Fala Hill, both road and railway are 900 feet above sea-level, whence a descent is made to Stow and Galashiels. The old Break Neck Road on the west side of the valley must have been worse, as it pursued its course in straight lines down Wedale, or Vale of Woe, which belonging to the Bishop of St. Andrew's, he had a palace here called Stow.

Dr. Adam Smith recorded that the common carrier from Selkirk to Edinburgh, 38 miles distant, "required two weeks to make out his journey betwixt the two towns, going and returning, with a suitable resting time at each to his poor fatigued horse, which had perhaps not less than five or six hundred-weights of goods to drag along. The road, originally, was among the most perilous in the whole country; a considerable extent of it lay in the bottom of that district called Gala Water, from the name of the principal stream". The channel of the water itself, when not flooded, was the track chosen, as being the most level and easiest to be travelled on. The rest of the way, very much up-and-down hill, was far worse. The townsmen of the adventurous individual, in the morning of his way-going, turned out to take their leave of him, and to wish him a safe return from his perilous undertaking." This is a journey which the railway has now made possible in about an hour and a half.

The pioneer of the Waverley route on the Edinburgh side of the notch of the Lammermoors through which the railway now passes was a short line begun in 1826, and opened in 1831, which ran from Edinburgh to Dalhousie, with branches to Leith (1835) and to various coalfields. The total cost was about £130,000. It was opened to Dalkeith in 1838: and what was known as the Dalkeith branch belonged to the Duke of Buccleuch. By road

the distance is about 6 miles; owing to the curves in the route of this horse or "Innocent Railway" as it was called, it was lengthened out to 11 miles; with its branches it was 14 miles. This section was taken over by the North British Railway in 1845. The lumbering carriages and slow-paced horses would be laughed at nowadays. Yet on holidays and on Musselburgh race days, thousands of passengers were thus transported from Edinburgh. The coaches have been described as a sort of hybrid between the old-fashioned stage-coach and the modern omnibus, and in summer the outside seats were most popular. An

open carriage possessing a most ancient and fish-like smell, with fishwives for Fisherrow, was often placed in the rear. Nobody used to be late for the train, which stopped if any belated passenger was in sight. A traveller timed the journey of $4\frac{3}{4}$ miles, and found that it had taken *forty minutes*. A modern express can do eight times the distance in the same period. There was a board at all the stations forbidding the drivers to stop and

feed their horses, under a penalty of half-a-crown, and barefooted boys ran on in advance to change the switches.

There were earlier premonitions of a Border railway, that from Glasgow to Berwick, in 1810. The Town Council of Selkirk in 1820 was pleased to approve of a line from Dalkeith to St. Boswells down the Gala, but it did not come off just then. Captain Basil Hall was residing at Abbotsford in 1825; he noted that Scott and some of the wealthier Border lairds, notably a successful Leith banker, Mr. Henderson, of Eildon Hall, held conferences for the promotion of a

railway from Berwick to Kelso, which hung in the wind for many years. Scott told Miss Edgeworth that he was terribly bored by Henderson one day, who talked of nothing else; but he was a match for him, as he had at his "finger-end, every cut, every lift, every degree of elevation or depression, every pass in the country, and every means of crossing them." Hall was very hopeful, for he said, "I should expect that when the author of *Waverley* sets his shoulders to any wheel, it must be in a devilish deep slough if it be not lifted out." Yet Scott passed away ere it was lifted out, and much of the precious MS. of his



THE OLD WAVERLEY STATION, FROM PRINCES STREET GARDEN
EDINBURGH

novels went to Edinburgh by coach. A clergyman writing in 1834 deplored that the proposed railroad from Dalkeith to Galashiels, for which the ground along the vale of Gala had been surveyed, could not be taken up and carried through without delay. A line from Newcastle over Carter Fell to Jedburgh was projected in 1836, but never came off. Some years later, in 1844, a meeting of those interested was held in Galashiels to promote a railway between that town and Edinburgh, with ultimate extensions to Selkirk and Hawick. The chair was occupied by Major-General Sir James Russell, of

Ashestiel. The expenditure was estimated at £10,000 a mile; the money was to be furnished by a London company. Later, an arrangement was made with the North British Railway, which took up the matter, and carried it through. The railway was open for mineral traffic between Edinburgh and Galashiels on 1st February 1849, and for passenger traffic on the 19th. On 7th February the Directors and their friends passed over the Hawick branch from Bowshank to St. Boswells, and celebrated the event by dining together at Melrose. The branches followed as a matter of course; from St. Boswells to Kelso and Jedburgh; from

been cultivated, which has increased four or fivefold since the start in December 1884.

The original portion of the North British Railway was incorporated by Act 19th July 1844 for a line from Edinburgh to Berwick, with a branch to Haddington. In 1845 powers were given to purchase the Edinburgh and Dalkeith Railway, already referred to, and to construct a small branch (2 miles) to connect it with the main system. The powers of the "Edinburgh and Hawick" were transferred in the same year. In 1846 the Company obtained powers to construct branches to Selkirk, Jedburgh, Kelso, Tranent, Cockenzie, North Berwick and Duns.

We give below the dates of opening the various sections of the Waverley route, and they enable us to determine the progress of the railway works. For these figures, as well as some already given, we are indebted to Mr. J. T. Hedley of the Superintendent's office of the North British Railway. For many valuable facts as to the making of the line we must also acknowledge indebted-



OLD WAVERLEY GOODS STATION, EDINBURGH

Galashiels to Selkirk (first sod cut 1855, opened 25th March 1856); from Galashiels to Peebles in 1866, by vale of Tweed. This latter town had, however, been connected over Leadburn Moor by rail direct to Edinburgh since 1855. The latest branch is the Suburban line which leaves the North British Railway at Haymarket, passes through the suburbs of Morning-side and Newington, and joins the Waverley route for Edinburgh, a little south of Portobello. Originally meant to relieve the congestion of the Waverley Station by affording a passage for goods trains from east or west without touching at the Waverley, a good passenger traffic has also

ness to Mr. George Somerville, of Somerville and Crombie, engineers, Edinburgh. On 31st July 1845, the Royal Assent was obtained to an Act for "Making a railway from the Edinburgh and Dalkeith Railway to the town of Hawick in the county of Roxburgh." Under Clause IV. of this Act the capital of the company was to be £400,000. The Act further stated that the "said railway shall commence at and join the southern terminus of the Edinburgh and Dalkeith Railway, at, or near to Dalhousie Mains, in the parish of Cockpen in the county of Edinburgh, and shall pass through the following places or some of them (that is

to say), Cockpen, Newbattle, Temple, Borthwick, Crichton, Heriot, and Stow, in the county of Edinburgh; Stow and Galashiels in the county of Selkirk; Melrose, St. Boswells; Ancrum, Wilton, and Hawick, in the county of Roxburgh, and shall terminate at or near to the town of Hawick in the said county of Roxburgh." It was well that the wording of the Act was guarded as to the places passed, as Cockpen and Temple are a good bit west of the railway, while Ancrum is served by Belses, several miles westwards. It was let to contractors in sections; that section over Middleton Moor being extremely difficult owing to the gradients and the marshy nature of the ground.

Despite the very severe gradients a driver has taken a saloon behind a locomotive from Edinburgh to Carlisle, 98½ miles in 105 minutes. With fast trains going south the usual method is to attach a pilot at Hardengreen, for the long push up the incline to the top of Fala moor, 900 feet above sea level. The descent to Galashiels (33½) is easy afterwards. Time, 49 minutes to Galashiels; Hawick in other 15 minutes. The route which leaves the Waverley Station by the Calton Tunnel, forks south at Portobello, passes over part of that of the former "Innocent Railway" ere Eskbank is reached. As the Lammermoors are approached, some scenes of striking beauty meet the view, including



COLLISION NEAR PENICUIK, OCTOBER, 1863

DATE OF OPENING OF SECTIONS OF WAVERLEY ROUTE.

Niddrie and Dalhousie June 21, 1847.
Dalhousie and Fushiebridge. July 12, 1847.
Fushiebridge and Bowland.. Aug. 4, 1848.
Bowland and St. Boswells... March 2, 1849.
St. Boswells and Hawick.... Oct. 25, 1849.

HAWICK TO CARLISLE.

Hawick and Scotchdyke... August 1862.
Scotchdyke and Carlisle... November 1861.

These are the official dates of opening, but we find the *Scotsman* recording, as already mentioned, that the line from Edinburgh to Galashiels and St. Boswells was opened and being used for passenger and mineral traffic during February 1849.

Borthwick Castle on the right; then on the left Crichton Castle; Gorebridge, Tynehead, and Heriot are passed, while the train moves through a wild pastoral region, and rushes down the Vale of Gala, by Stow and Fountainhall, to the manufacturing town of Galashiels. We are now on Tweedside, close to Abbotsford; in the classic vale of Melrose, with its abbey, dominated on the south by the three Eildons; St. Boswells (3 miles) is now a thriving junction, for Earlston on the Duns line; and Kelso, and Jedburgh. Hawick is soon reached by the Carlisle route, and it is the end of our journey for the present.

Mr. John Miller, C.E., was engineer of the Hawick line. We hardly know

whether it was a compliment or otherwise to Miller, the remark made by Lord Minto while travelling in the first train on the new line south. His Lordship said, "Mr. Miller, this must have been a very easy line to plan; you simply took a seat on the south-going coach, and sketched the contour from the high road." The cutting through Middleton Moor to the summit at Fala Hill, and the great embankment over Borthwick Glen, 130 ft. high, being all of a soft boggy nature, was a difficult undertaking. Indeed, Moore and Wilson, the contractors, gave it up, and the work had to be completed by the North British Railway. The firm of Lorimer and Somervaille constructed the North

opened, January 18th, 1846, there were only 14 locomotives to begin with.

At the date of the opening of the Hawick line the North British Railway possessed 55 engines, 186 carriages, and 1,666 waggons. The locomotives were all from the workshop of Hawthorns, of Newcastle, except a Crampton from Leeds.

In clearing out the space below the North Bridge and beyond for the Waverley Station, many old landmarks disappeared, such as the Green Market, the Physic Gardens, once cultivated for medicinal herbs; Lady Glenorchy's Chapel, and Trinity College Church. The latter was built partly on the model of a building founded in 1462 by Mary of Gueldres. When the church was taken down the stones were numbered in order that it might be erected elsewhere.

When the Lauder Light Railway Act is put into force, Lauder on the south slope of the Lammermoors will be much more accessible from Edinburgh and the south. The order applied for by the Light Railway Companies has just been confirmed by the Board of Trade.

This railway will be ten miles in length, and leaves the Hawick

line near Fountain Hall Station. The gauge is to be 4 feet 8½ inches, and the period for completing the works is five years.

There have been very few fatal accidents on the Southern Sections of the North British Railway, but one Thursday afternoon in October 1863 a disastrous accident occurred to the express passenger train from Edinburgh on the Peebles railway near Penicuik. A ballast train was on its way from Leadburn to Linton, the line being in course of construction, and through the breaking of a coupling chain some of the waggons became disconnected and rushed down the incline with great velocity, coming into collision with



THE TERMINUS OF THE HAWICK LINE IN THE OLD WAVERLEY STATION, EDINBURGH

British Railway from Physic Gardens (the present Waverley station) to Fisherrow, near Musselburgh; and the Hawick line from Portobello to Dalhousie. The important Calton Tunnel, going through the south base of the Calton Hill, which was lately pierced again for the suburban line, was a considerable item in their total contract, which reached a sum of £300,000. It also included some buildings at the Waverley Station, engine shops and sheds at St. Margaret's, between Edinburgh and Portobello, and the transforming of the Innocent railway at St. Leonards from Niddry to St. Leonards into a full working branch.

When the main line to Berwick was

the express, smashing the engine and tender, and telescoping the carriages as shown in our sketch. Among those who were in the train and escaped altogether unhurt was Mr. Walter Wilson, of Hawick.

The first Locomotive Superintendent was a Northumbrian, Mr. R. Thornton, a pupil of Hawthorns and Co. Mr. James Bell who had been resident engineer under Mr. John Miller during the construction of the various lines, was appointed engineer for the railway in 1846, and continued in that office till his death

and occupied, a new North Bridge has been erected, while a first-class hotel is in progress, and handsome new booking-offices, platforms, and sidings have taken the place of the old. Exclusive of new hotel and goods station the cost will be about £1,250,000. The stranger finds the Waverley station at present just a little like the Maze at Hampton Court.

HAWICK TO CARLISLE.

For about 10 years Hawick was the terminus of the line from Edinburgh,



THE NEW WAVERLEY STATION AND NORTH BRIDGE, EDINBURGH, NOW UNDER CONSTRUCTION

a few years ago. He was a man of pronounced ability, and retained the confidence and respect of the various Boards of Directors under whom he served. His son, Mr. James Bell, now fills his place. The first Chairman of the North British Railway was John Learmouth, of Dean, a former Lord Provost of Edinburgh.

Our illustrations show the change that has been going on at the Waverley Station, where the old erections of 50 years ago have disappeared. Gradually the basin of the valley has been annexed

when the opening of the Border Union Line to Carlisle gave through connection by the Midland route to London.

Among the early pioneers and promoters of the North British Railway to Hawick, Mr. Walter Wilson, of Messrs. Walter Wilson and Sons, manufacturers there, should not be forgotten. By the courtesy of his son, Mr. Edward Wilson, of Beechhurst, Hawick, we are enabled to give an outline of what he was enabled to accomplish, from the *Hawick News* of 1882.

Such was the state of locomotion in

Mr. Wilson's youthful days, that only a 'fly' ran between Hawick and Edinburgh. It took a whole day to accomplish the journey, and passengers had to get dinner and tea on the way. Mr. Brown—or 'Billy Brown,' as he was familiarly called—became 'landlord' of the Lower Inn in the year 1804, and, being a man of enterprise, he, with others, started a four-horse coach. A mail coach was also set on the road two years later. The fare to Edinburgh, at that time, was 28s. inside and 20s. outside, including guard and driver. This state of matters continued for about sixteen years, when Mr. Wilson happened to be travelling in the mail coach with Mr. Croal, of coach notoriety, who suggested the propriety of running another coach at cheaper rates. Mr. Wilson considered the idea to be a good one, and spoke of it to Mr. Nixon, and other leading men in the town. These at once met, and subscribed £10 each.

Forthwith an opposition coach was started from Carlisle to Edinburgh, by way of Langholm, Hawick, and Selkirk. The name of the coach was "Engineer," the fare between Edinburgh and Hawick being 15s. inside and 10s. outside.

In 1822 Mr. Wilson joined five gentlemen in the purchase of a gig, for their private use, which came to be known in the neighbourhood as the 'Hawick Gig.' It may here be mentioned, as a proof of how little driving there was then, that no two of the proprietors required the said gig at the same time. The tax for a gig was £6 10s., a horse £1 17s., and a groom £1 per annum.

But the greatest of all Mr. Wilson's locomotive enterprises was the part he took in providing railway accommodation for the South of Scotland, more especially the Border Union Railway, now the Waverley Route. In the winter of 1844-45 he was sent for by Mr. Wood, the law-agent of the North British Railway Company, and it was agreed to take the traffic between Edinburgh and Hawick. When the committees sat, Mr. Wilson went to London

to prove the traffic, which was confirmed by Mr. Nixon. The Act was got in 1845, and the line constructed. In 1846 the North British Railway Company requested him to proceed to London in connection with the Bill before committee to extend the line from Hawick to Carlisle. In the same Session, and before the same committee, the Glasgow and South Western Company were promoting their Bill for a line from Glasgow, through Ayrshire, to Carlisle. On the committee balloting, the Glasgow and South Western was adopted, and the North British scheme was consequently rejected. In 1847 the North British again proposed to extend to Carlisle, and in the same Session the Caledonian Company brought forward a scheme for a railway from Carlisle to Gilnockie Tower, which was extended to Langholm by the Committee. This was adopted, and the Caledonian Company got five years to make it, but failed to do so.

The ground being again clear for the operations of the North British, their agents desired the Hawick committee to form a company, with their assistance. Various meetings were held, but nothing was done till 1856, when the North British Railway's Report stated willingness to support a scheme for a line from Hawick to Carlisle. The Caledonian Company then came forward with their proposal to take the line by way of Langholm, which ultimately received the support of his Grace the Duke of Buccleuch. There were thus two schemes in the field. In the meantime it was discovered that a route could be obtained—an extension of the Border Counties line to Hawick from Riccarton—and the North British decided upon adopting a junction at Riccarton with the Border Counties Railway, and to proceed to Carlisle by Liddesdale, which was ultimately carried, though the controversy was hot and protracted. The part taken in it by Mr. Wilson may be thus briefly sketched. There was a meeting of Directors, Town Councillors, and other

leading men held in the Tower Hotel, on Wednesday, 23rd September, 1857. At this meeting Mr. Wilson was present, and moved for a railway between Hawick and Carlisle by way of Liddesdale. The motion was seconded by Mr. Alexander Laing. An amendment was proposed by Mr. James Oliver, and seconded by Dr. Elliot of Goldielands; the motion was carried by a large majority. Having thus initiated the Liddesdale railway scheme, Mr. Wilson strove as he never strove before against heavy odds and ducal in-

nights in Hawick at that time, which we cannot conveniently here describe, only taking one as sample. It happened about the middle of April, 1859, at a time when it was thought this great railway struggle was past; but all of a sudden a conspiracy took place by a few North British shareholders, interested in the Caledonian scheme, who endeavoured to carry a meeting of the North British Railway Company against the making of the railway; but their design was frustrated. Mr. Walter Wilson and several Hawick



THE NEW WAVERLEY STATION, EDINBURGH, UNDER CONSTRUCTION,
AND, THE NEW NORTH BRIDGE, COMPLETED

fluence, on platforms everywhere, as well as before committees of both Houses of Parliament.

A thousand single-handed fights might be detailed which were fought by Mr. Wilson, and incidents out of number related. In a ballad on the famous railway meeting at Kelso, he is described as trying "to calm the troubled sea," and in another verse he is depicted in rather a lively attitude—

"It was like a fight just budding,
Though he gave no blows,
When he held a stick within an inch
Of his opponent's nose."

There were many exciting days and

shareholders were at the meeting, and helped in the victory.

When these railway heroes arrived at Hawick Station that night at nine o'clock, they were met by a great gathering of townsfolk and the Sax-horn Band. A procession was formed with the band and railway shareholders to the front, and a triumphal march took place to the Cross, where exultant speeches were made from the top of the council stairs by Bailie John Paterson and Mr. Walter Wilson. The Railway Bill had still to be fought through the House of Lords, and through it went with flying colours."

The important ceremony of cutting the

first sod of the Border Union Railway—Hawick to Carlisle—took place on Wednesday, September 8th, 1859, and was attended by a greater number of people than ever previously assembled together in the locality, either in ancient or modern times. Excursion trains brought passengers from every station on the North British System.

Liddesdale was almost entirely deserted; the valley of the Tyne sent its quota and the ingathering of the grain was suspended, to enable the stalwart lads and buxom lasses of the hills and dales to behold a sight such as was never seen in Teviotdale before.

Proceedings were opened by prayer, offered by Rev. John Mackae, minister of the parish (Hawick). Mr. Wood, Law Agent of the Company, read the preamble of the "Border Union (North British) Railway Act, 1859," authorising the construction of the Railway.

—Richard Hodgson, Esq., Chairman of the North British Railway Company, then addressed the assemblage:—

"Ladies and Gentlemen,—We are met here to-day to take the first steps toward the consummation of that great work in the prosecution of which many of us have been engaged, and in the completion of which every one here is interested. For two years you and I, and those who have acted with us, have struggled for the attainment of the object which we have at last attained. For two years we have struggled against potent influences—against all that money and influence could bring against us; but truth and justice have prevailed at last, and we have obtained what we should have obtained long ago—an Act to make a Railway from Hawick to Carlisle. When I look back to those fierce conflicts of words and deeds, the struggles, the vicissitudes; when I look back on the hopes and fears which alternately raised and depressed the spirits, not only of the originators of

this railway, but of the great majority of the population of the south of Scotland and the north of England—I say, that we have at last succeeded in that object which you and I have worked for so long. My heart exults that the people's railway has at last been authorised by Parliament. We have been told that we shall be dilatory in making the railway. The answer is here to-day. You, madam (continued Mr. Hodgson, turning with good-humoured pleasantry to Mrs. Hodgson, who seemed to enter heartily into the gratification of the projectors of the railway) will now have to execute the first part of the Hawick contract—the most difficult. You will find, madam, that when you have raised the first sod, there will be strong arms and stout hearts to follow you. I have now to ask you, madam, to perform the duty assigned to you."

Mr. Grant having placed a nosegay on the spot where the sod was to be cut, Mrs. Hodgson, amid loud cheers, advanced spade in hand and lifted it with quite a navy, professional air into the barrow. She then wheeled it down the bank, tilted out the sod, and, turning round, drew the barrow after her back to the place from where she started.

The booming of cannon from the hill above announced to the people for miles around that the construction of the Border Union line had begun.

Bailie Paterson then presented Mr. Hodgson with the freedom of the town of Hawick.

The banquet was held in a pavilion erected on the Common Haugh. Mr. Walter Wilson was one of the croupiers, and in choice language and sincere sentiment proposed the health and prosperity of the sailor Duke, his Grace of Northumberland. In 1860 Mr. Wilson became a Director of the North British Railway Company.

Such is the story of the "Waverley Route."

SOME EARLY LOCOMOTIVES OF THE NORTH STAFFORDSHIRE RAILWAY

By BRUNEL REDIVIVUS



HE illustrated interview with the General Manager of the North Staffordshire Railway that appeared in the RAILWAY MAGAZINE for February last, having excited considerable interest, an account of some of the iron horses, formerly employed upon the North Staffordshire Railway, is now presented.

By way of introduction, it may be remarked that newspaper reporters of fifty years ago had not much practical acquaintance with locomotives, and that when describing them, they considered it necessary to do so in grandiloquent rather than in correct language.

Prior to the public opening of the North Staffordshire Railway, a trial was made on 8th March 1848, of some of the locomotives, and the *Staffordshire Mercury*, in describing the "six powerful engines covered with numerous banners bearing appropriate inscriptions," stated that "the engine which led the van had the word 'Dragon' emblazoned boldly on its boiler." The name of this engine originated in a suggestion by Mr. C. J. Mason, on the occasion of the cutting of the first sod. Mr. Mason observed "that within the memory of the oldest inhabitants, the materials and manufactured goods of the district were conveyed on the backs of pack-horses, and that the most celebrated animal employed in that business—"one who bore the bell" for the greatest

number of years—was known far and wide by the name of "Dragon."

"He therefore thought, as the potteries had progressed from pack-horses to canals, and were then about to exchange the creeping boat for the flying steamer, that the directors would do well to distinguish their first locomotive by the same name." The engine shed not being yet completed, the locomotives were temporarily housed in the goods station.

"They are all of the very best construc-

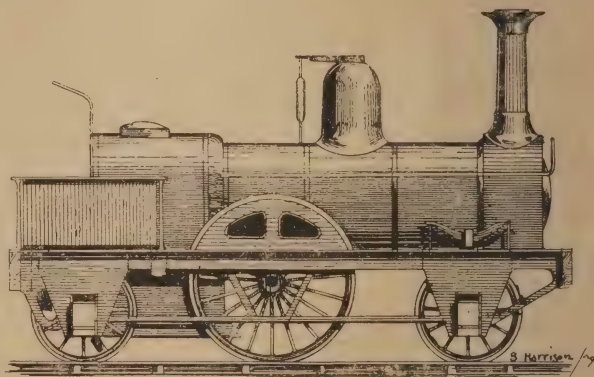


FIG. 1

tion and workmanship, and are built on Stephenson's patent principle. Two of them are from the celebrated works of Sharp Brothers & Co., of Manchester, two were built by Potts & Jones, of Newton on the Willows, and the remaining two by Hick, of Bolton."

After reading such a glowing description of the "Dragon," a locomotive enthusiast would believe himself to be on the track of a class of locomotives not previously tabulated. But alas! the

"spirit of enquiry" meets with a rude disappointment, for upon applying to Messrs. Sharp, Stewart & Co., Limited,

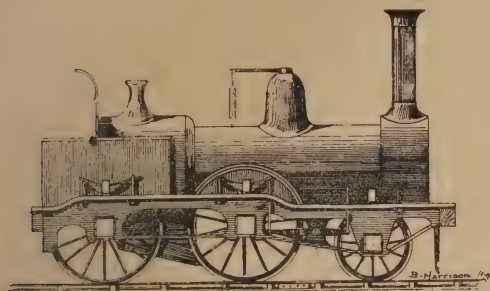


FIG. 2

for particulars of the wonderful "Dragon," we are informed that a search amongst the firm's records showed that there was nothing of a special character in the design or construction of the "Dragon," and that she did not have a long boiler on Stephenson's plan. Indeed the mighty "Dragon" was one of Sharp's celebrated standard type of passenger engines.

Her principal dimensions were—

Cylinders, 15 in. diameter, 20 in. stroke; boiler, 3 ft. 6 in., diameter, 10 ft. long; 147 tubes of 1½ in. diameter; heating surface, 748·2 sq. ft.; driving-wheels, 5 ft. 6 in. diameter; leading and trailing wheels, 3 ft. 6 in. diameter; wheel base, 12 ft. 8 in. diameter. The "Dragon" was provided with a six-wheel tender, with a water capacity of 1,000 gallons. The North Staffordshire Railway does not appear to possess any drawings, sketches, or details of the earliest locomotives used on the line. Mr. Longbottom, the Locomotive Superintendent, however, went to some considerable trouble to endeavour to supply particulars of the earliest engines.

The search for the details resulted in the unearthing of a pocket-book, in which, late in the "sixties," one of the officials of the Locomotive Department had entered particulars of some of the engines, together with sketches of the same. These we now reproduce.

It will be observed that of these six curious old engines four are 'tanks,' probably being tender engines rebuilt as such.

Dealing first with the two tender engines, the illustration (Fig. 1) shows one to be an inside cylinder, six wheel, "single" locomotive, the L and T wheels of which have outside bearings, whilst the driving wheels have inside bearings. The boiler barrel is composed of three rings, on the centre one of which is a large steam dome fitted with a "Salter" lever safety-valve. The fire-box is of the well-known raised pattern. The principal dimensions of this North Staffordshire Railway passenger engine are: cylinders, 15 in. diameter; stroke, 22 in.; driving-wheels, 6 ft. 1 in. diameter; leading and trailing, 4 ft. diameter; total wheel base, 14 ft. 9 in.; weight, L, 10 tons, D, 13 tons, T, 7 tons; total, 30 tons.

The boiler contained 142 tubes 10 ft. 3 in.

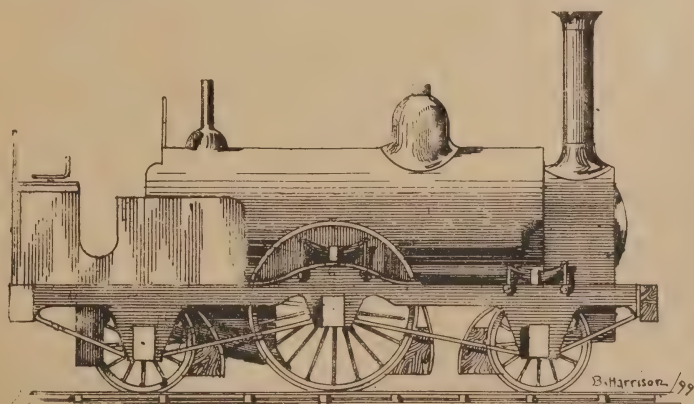


FIG. 3

in length. Nine engines of the above type were in use on the North Staffordshire Railway; these were numbered 16, 17, 18, 20, 21, 22, 23, 24, and 25.

Fig. 2 also illustrates a formerly well-known type of our-coupled engine, with outside frames, raised fire-box, and sloping

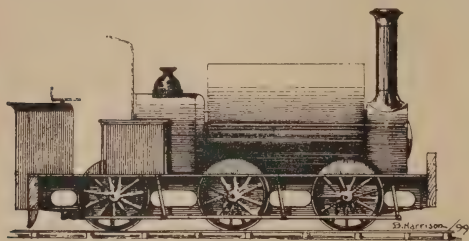


FIG. 4

grate. It will be observed that the springs of the leading and driving wheels are connected by means of the once fashionable compensating beam.

The (inside) cylinders of this engine were 15 in. in diameter, the stroke being 20 in. The boiler contained 125 tubes, 9 ft. 6 in. long. The diameters of wheels were: L, 3 ft. 7 in.; D and T, each 5 ft. 7 in.; weight on axles, L, 8 tons 1 cwt.; D, 10 tons 2 cwt.; and T, 8 tons; total, 26 tons 3 cwt.

The North Staffordshire Railway at the time in question owned four locomotives of this class, viz., Nos. 26, 27, 28, and 29. Having described the two most ordinary specimens of these old North Staffordshire locomotives, we can now turn our attention to the four curious examples of tank engines.

The principal dimensions of these will be found in the appended table; but before considering them it will be of interest to note the principal features of the engines in question.

The first glance at the illustrations (Figs. 3, 4, 5, and 6), shows the four engines to be of the saddle-tank type, but

here the similarity ends. Fig. 3 has outside frames and "single" drivers, whilst the immense wooden brake-blocks and convex smoke-box door are in evidence. The tank of this engine carried 625 gallons of water, and the bunker would accommodate three-quarters of a ton of coal.

The engine illustrated by Fig. 4 appeals to the eye through the abnormally high saddle-tank, which apparently towers quite 3 ft. above the top of the boiler. This latter is 3 ft. diameter and 8 ft. 3½ in. long. The inside measurements of the fire-box of this Liliputian "iron horse" are 3 ft. by 3 ft. The North Staffordshire Railway had five locomotives of this design, which were numbered 51 to 55.

Fig. 5, it will be noticed, illustrates an outside-cylinder engine, with the driving and trailing wheels coupled, and inside main frames. This locomotive is specially favoured in the matter of water tanks, being provided with two wing, as well as a short one of the saddle type. The latter, it will be observed, extends only a few inches beyond the side tanks, finishing before the steam dome is reached.

Fig. 5 shows the engine to be provided

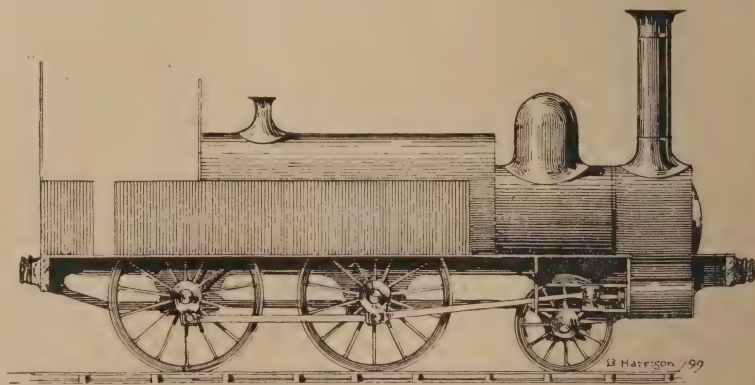


FIG. 5

with two wind guards, or spectacle screens. The designer might have been a little more liberal with his sheet iron, and provided a top connecting-piece between the two

screens. By doing so, he would have given the engine-men a cab. The four engines of the above type were Nos. 6, 8, 9, and 11.

In Figure 6 we have illustrated a six-coupled engine, with outside frames. All the wheels are beneath the boiler barrel, the fire-box overhanging the rear end, and the smoke-box doing the same at the front. In this example of North Stafford-

engine, viz., L to D 6 ft. 3 in., D to T 4 ft. 3 in. Total, 10 ft. 6 in.

The six engines of this class were numbered 47, 48, 49, 50, 56, and 57.

Figure 7 illustrates a more modern type of North Staffordshire Railway locomotive, but one sufficiently old to be obsolete, all the engines of this design have long since been rebuilt. The original princi-

DIMENSIONS OF NORTH STAFFORDSHIRE RAILWAY SADDLE-TANK ENGINES

	FIGURE 3.	FIGURE 4.	FIGURE 5.	FIGURE 6.
Diameter of Wheels :—				
Leading	3 ft. 7 in.	3 ft.	3 ft. 6 in.	4 ft.
Driving	5 ft. 7 in.	3 ft.	5 ft. 6 in.	4 ft.
Trailing	3 ft. 7 in.	3 ft.	5 ft. 6 in.	4 ft.
Total Wheel Base ...	14 ft.	11 ft. 6 in.	14 ft.	10 ft. 6 in.
Diameter of Cylinders ...	15 in.	13 in.	15 in.	16 in.
Stroke	20 in.	18 in.	22 in.	22 in.
Number of Tubes	125	81	112	117
Length of Tubes	9 ft. 6 in.	8 ft. 8 in.	11 ft. 8 in.	12 ft. 4 in.
Weight on Leading Wheels	8 tons 18 cwts.	6 tons 18 cwts.	10 tons 5 cwts.	8 tons 15 cwts.
Weight on Driving Wheels	13 tons 16 cwts.	8 tons 3 cwts.	11 tons	12 tons 10 cwts.
Weight on Trailing Wheels	9 tons	5 tons 17 cwts.	10 tons 15 cwts.	12 tons 15 cwts.
Total Weight	31 tons 14 cwts.	20 tons 18 cwts.	32 tons	34 tons
Coal Capacity of Bunkers...	15 cwts.	15 cwts.	18 cwts.	1 ton

shire locomotive practice, the saddle-tank covers the whole of the boiler barrel,

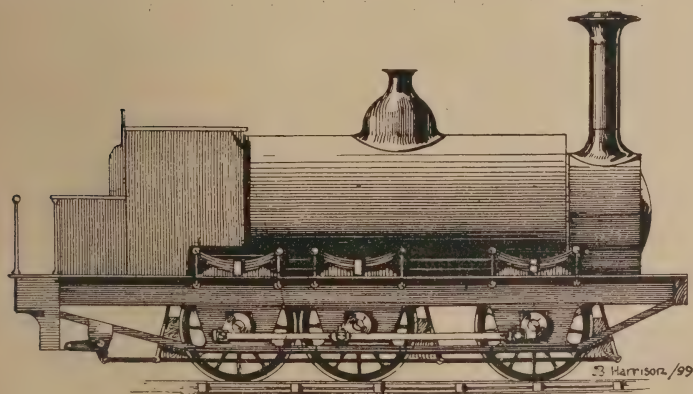


FIG. 6

whilst extremely high rectangular coal bunkers enclose the fire-box. Mention must be made of the wheel-base of this

pal details of the 6 coupled tender goods engine in question were:—Cylinders,

16 in. diameter, 24 in. stroke, diameter of wheels 5 ft. Total wheel base 14 ft. 10 in.; steam pressure, 120 lbs.; weight, L 11 tons 10 cwt.; D 11 tons 17 cwt., and T 7 tons 14 cwt. Total, 30 tons 11 cwt. Six of these engines were built by Hudswell and Clarke, of Leeds, in 1867, the original North Staffordshire Railway numbers being 69 to 74. They have, as already mentioned,

been rebuilt to the standard North Staffordshire Railway goods engine pattern; their present numbers being 78 to 83.

We are indebted to Mr. L. Longbottom, the enlightened Locomotive Superintendent of the North Staffordshire Railway, for most of the facts enumerated in

this article, and we beg to tender him herewith our most sincere thanks for the valuable assistance he has so willingly accorded us.

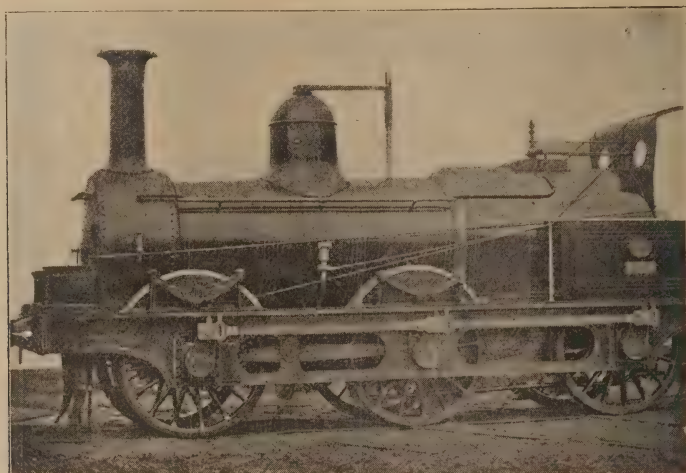


FIG. 7.

THE GENESIS OF THE RAIL-WAY.

In a publication of long ago, known as the "Pitman's Pay," the following lines, in strong Northumberland dialect, express in an original fashion the gratitude of the miners of those days to the inventor of the cast-iron rail :—

"But heavy puttin's now forgotten,
Sic, as we had i' former days;
Ower holey thill * an' dyels † a splittin',
Trams now a-run on metal ways.

"God bless the man wi' peace and plenty
That first invented metal plates,
Draw out his years te five times twenty,
Then slide him through the heevenly gates.

"For if the human frame te spare,
Frae toil an' pain ayont conceevin',
Hae aught te de wi' gettin' there,
Aw think he mun gan' strite to heeven."

* The sill or floor of the mine.

† Deal boards.

VIA QUEENBORO' AND FLUSHING

(The Zeeland Steamship Company)

By D. T. TIMINS, B.A.



WHEN an Englishman desires to enlarge his knowledge of the world, he must perforce first traverse the belt of blue sea which encircles his island home.

Hence it comes about that a species of traveller indigenous to Great Britain has

Continent, there is one which occupies an unique position. We refer to the Zeeland Steamship Company. They are the only independent steamship company engaged in the work of carrying on cross-channel traffic. The vessels plying on every other route are the property of some railway company. The Dover and



ONE OF THE NEW STEAMERS CROSSING FROM QUEENBORO' TO FLUSHING

sprung up. This species is commonly known as the "Cross-channel" or "Continental" passenger. For his conveyance various lines of steamers have been established between points in England and foreign ports, and trains have been arranged to run in connection with these vessels on both sides of the Channel. Among the various companies whose boats ply daily between England and the

Calais Mail Packets are owned by the London, Chatham & Dover Railway Co. and the Northern Railway Company of France; the Harwich-Hook-of-Holland vessels belong to the Great Eastern Railway Company, and so on in every case, except that of the Queenboro'-Flushing boats. RAILWAY MAGAZINE readers have already had an opportunity of learning the history of many of these continental

services. It is the object of the present paper to add to their knowledge by giving them some account of the Zeeland Steamship Company.

The great financial advantages which the railway-owned steamship lines possess over the latter company need scarcely be pointed out. It is obvious that, in the former case, should there be a loss (as there is in every single instance) on the continental traffic, it can be made up

prove interesting. Flushing itself and the Island of Walcheren are historical places. Walcheren is ten miles in length by eight miles in breadth, and is famous by reason of the Earl of Chatham's expedition thither in 1809 for the purpose of destroying the naval arsenal which Napoleon was establishing at Antwerp. But as the former unfortunately stopped *en route* in order to take Flushing, Napoleon was enabled to put Antwerp in a state of defence. Result,



THE DAY STEAMER AT FLUSHING AWAITING ARRIVAL OF THE GERMAN MAILS

from the other sources of revenue which the railways tap. But this is not so with regard to the company under consideration. They stand absolutely alone. If there is a deficit, it can only be wiped out by an augmentation of the steamboat receipts. The Zeeland Steamship Company have no other source of income to fall back upon. All the more credit is therefore due to them for the fact that each year they can boast of an increased profit.

Some account of the establishment of the Queenboro'-Flushing service, and also of its development and growth from its inception down to the present time may

the 7,000 soldiers left in Walcheren died of fever, and twenty millions of money were wasted.

At the commencement of the Spanish war, Flushing was the first town to follow the example of Brielle and expel its Spanish garrison. Thirteen years later, when the Dutch appealed to Queen Elizabeth of England for assistance, Brielle and Flushing were handed over to her as "cautionary towns." Sir Philip Sydney was then appointed governor of Flushing. In 1585 the latter wrote home that the town "was a great jewel to the Crown of England," and even after its abandonment by the English, it continued to be a strong

fortress down to 1867. In that year the Dutch demolished the ramparts, and determined to try and make of Flushing a considerable port. To this end they built a large harbour, divided into three parts, the Outerport, and the two Innerports, the former having an area of 32 acres and a depth of 21 ft. at low water. A canal, 24 ft. deep, connects the harbour with Middelburg and Veere, and cuts the Island of Walcheren into two parts.

Though most people who cross by the Queenboro'-Flushing route will simply step from the steamer into one of the express trains which are drawn up in readiness to convey them to various parts of Europe, yet the town of Flushing is well worthy of a short visit. The steamers come to anchor alongside large floating pontoons, which rise and fall with the tide, and are connected with the station by means of a bridge. The new station, opened on August 23rd, 1894, is itself a very handsome structure, and contains amongst other things a spacious hall 100 ft. in length by 90 ft. in breadth. The Royal Waiting Room is a fine apartment, 26 ft. square, with massive oak furniture, whilst the public refreshment-room is 50 ft. square and can dine 250 persons. Outside there are three platforms, *i.e.*, the main platform, 87 yards long and 11 yards broad; and two others at right angles to it, each 230 yards in length. One of these platforms accommodates a single and the other a double line of rails. Ten trains can be drawn up in Flushing Station simultaneously.

The town itself is a mile from the harbour, the principal objects of interest being the Town Hall and St. Jacob's Church (built in 1328). The west side of the town is the newer and more fashionable quarter, a great number of houses having

been built on the site of the old fortifications.

The harbour of Flushing was opened in 1873, but it was not until two years later, at the suggestion of Prince Hendrik of the Netherlands, that a steamship service to England was inaugurated. The Prince had always taken a lively interest in the commercial welfare of his country, and it was mainly owing to his exertions that the London, Chatham, and



IN THE DINING CAR OF THE FLUSHING EXPRESS

Dover Company were induced to take the matter up. The latter Company built a steamer pier at Queenboro', and the beginning of the year 1875 saw the establishment of a regular night service between England and Holland. A small fleet of paddle steamers had been purchased, but they were supplanted in 1877 by two large boats, the "Prinses Marie" and "Prinses Elisabeth," both built to the designs of Mr. (afterwards Sir) William

Pearce, M.P., in the yards of Messrs. John Elder and Co., on the Clyde. In 1880 a similar vessel, the "Prins Hendrik," was launched, followed in 1883 by the "Willem, Prins van Oranjé." The dimensions of these steamers were:—

Length	...	...	280 ft.
Breadth	...	...	35 ft.
Depth	...	...	16 ft. 6 in.
Gross tonnage	...	...	1,570
Nett tonnage	...	...	860

The engines were of the oscillating type,



A PORT-SIDE CORNER OF THE SALOON OF A ZEELAND STEAMSHIP COMPANY'S MAIL BOAT

their capabilities and dimensions being as follows:—

Diameter of low pressure cylinder	...	8 ft. 8 in.
Diameter of high pressure cylinder	...	5 ft.
Stroke	...	7 ft.
Revolutions per minute	...	37
Steam pressure	...	75 lbs.
I.H.P.	...	3,500

The new service acquired a widespread popularity, and a total of 13,000 passengers carried during the year 1876 had increased in 1886 to 68,000. Since May 1878, the boats of the Zeeland Steamship Company had also been entrusted with the mails.

About this time (*i.e.*, 1886) the Dutch Government began to press the Zeeland Steamship Company to establish a day service. The directors naturally hesitated to incur the huge additional outlay which such an innovation would involve, but they eventually yielded to the solicitations of the Government, and gave orders to the Fairfield Shipbuilding Company for the construction of three new and larger boats. These vessels were named respectively the "Engeland," "Duitschland," and "Nederland," and formed a noteworthy addition to the fleet of steamers plying between Queenboro' and Flushing. The following were the dimensions of the three new boats:—

Length	...	286 ft.
Breadth	...	35 ft. 3 in.
Depth	...	16 ft. 6 in.
Gross tonnage	...	1,650
Nett tonnage	...	870

They were fitted with three watertight bulkheads, two forward of and one abaft the engine-room. The oscillating engines were fitted with low-pressure cylinders of 9 ft. 6 in. diameter, high pressure ditto of 5 ft., with a stroke of 7 ft., and a steam pressure of 80 lbs. The indicated horse-power was 4,000 and the revolutions per minute 38. The following details are official:—

"The gross weight of the cast-iron work is 186 tons (the low-pressure cylinder being the heaviest piece); of the cast bronze 15 tons, and of the wrought-iron and steel work 157 tons (the shafts and paddles being the heaviest). Each steamer has four steam boilers, each weighing 37½ tons and constructed of 142 plates (1½ in. thick), with 16 ordinary boiler pipes and 104 stay tubes. The angle iron for each of the boilers weighs 1 ton, the entablature weighs 44 tons, the low pressure-cylinder 24 tons, the foundation plates with frames for taps 33 tons, the whole shaft (22 in. thick) with cranks 41 tons, each paddle 32 tons, each of the two condensers 8 tons, each superheater 7 tons, and each steam-winch 2 tons."

At first the day-boats were a financial failure; but, notwithstanding this fact,

there was an all-round yearly increase in the Company's traffic, both goods and passengers. In 1886, 27,000 tons of cargo were carried, and in 1894, 66,350.

There is no doubt that the fine boats run by the Zeeland Steamship Company were the prime cause of the improvement which took place in the steamers on other routes. This, again, re-acted upon the Company's traffic, and compelled the directors in 1894 to once more add to their fleet. Accordingly, they entered into a contract in December 1894, with the Fairfield Shipbuilding Company for three new steamers. Of these, the "Koningin Wilhelmina" was launched on May 23rd, 1895, the "Koningin Regentes" on July 9th of the same year, and the "Prins Hendrik" on August 22nd following. They marked an enormous advance on the earlier boats, and their dimensions were as follows :—

Length	338 ft.
Breadth	38 ft. 6 in.
Depth moulded ...	24 ft.
Gross tonnage	2,000
Nett tonnage	900

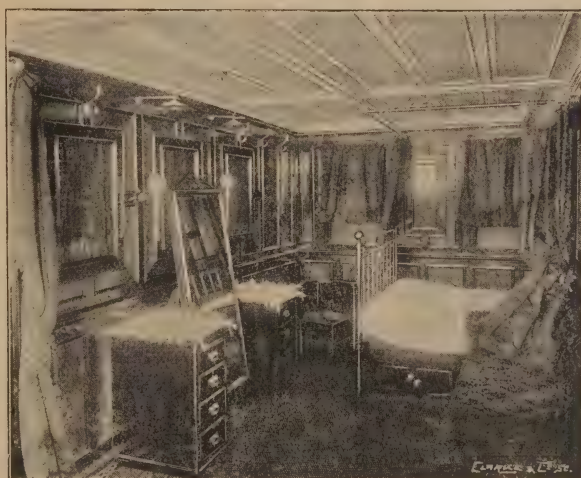
These steamers were fitted with diagonal triple-expansion engines, having three cylinders. The high-pressure cylinder was 51 in., the intermediate 75 in., and the low pressure 112 in. in diameter. The stroke was 6 ft. 6 in., steam pressure 170 lbs., and I.H.P. 8,000. The revolutions per minute were 48 and the speed over 21 knots.

And now a word as to the accommodation afforded to passengers on the various steamers. The day-boats are constructed on a different plan as regards their internal arrangements from that of the night-boats. They are the same in outward appearance, *i.e.*, flush decked with a large deck-house aft, but do not contain so many state rooms. They possess a roomy promenade deck and a large drawing-room on the upper deck, decorated with pictures

by Dutch artists. This is supplemented by a smoking-room and a number of private cabins. On the main deck are situated the ladies' cabins and lavatories, and a large dining-room, 50 ft. in length by 33 ft. in breadth.

Second-class accommodation is provided on the main deck forward, and consists of a large general saloon, and a separate cabin for ladies. The steamers are lighted by electricity throughout.

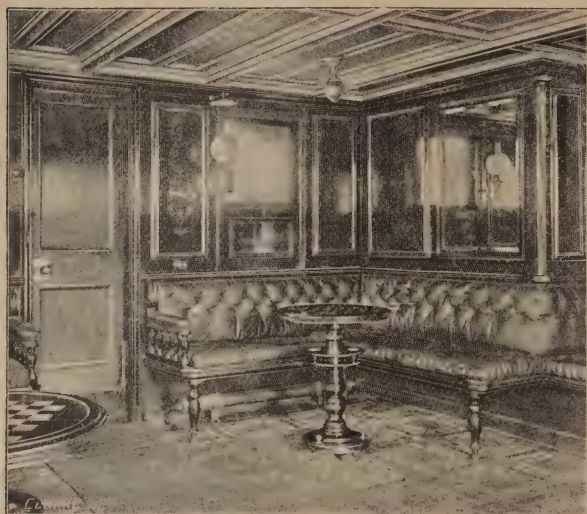
The new night-boats are luxuriously fitted up. On the upper deck, abaft the engine-room, are six deck cabins and the Imperial state-room; whilst in the same deck-



ROYAL STATE-ROOM ON A QUEENBORO'-FLUSHING STEAMER

house there is a large smoking-room. The dining saloon is situated on the main deck; it is capable of dining sixty passengers at one time. The decorations are of satin-wood and mahogany, relieved with pictures by celebrated Dutch artists. On the same deck are to be found the ladies' saloons, some of the first-class state-rooms, lavatories, and the purser's office. The remainder of the first-class state-rooms are located on the lower deck.

Second-class passengers are provided for forward of the engines on the main deck; there are two large cabins for gentle-



COSY CORNER IN THE SMOKING ROOM OF THE
QUEENBORO' MAIL STEAMER

men, and one for ladies. The boats are lighted throughout by electricity, and are flush-decked, with a bridge for the use of passengers between the paddle-boxes. They can accommodate 180 first, and 64 second-class passengers.

The ordinary regulations of the Board of Trade regarding life-belts, life-boats, and rafts, have been most amply complied with, the number carried being largely in excess of the actual requirements.

The speed has been periodically accelerated ever since the time when the steamers first commenced to ply between Queenboro' and Flushing, and now the journey is very expeditiously performed. The three new night steamers make much quicker passages than the older boats, the saving in time effected by the former being about $1\frac{1}{2}$ to 2 hours on the actual sea-crossing. The older boats cover the distance between Queenboro' and Flushing in from $7\frac{1}{2}$ to 8 hours, whereas the new boats perform the journey in 6 hours, which feat involves a continuous speed of 21 knots per hour. Originally the night boat left Flushing at 10.10 p.m., and the mail train in correspondence was due in London at 8 a.m. The time of the arrival in London

has always remained the same, but the hour of departure from Flushing has been altered to 11.25 p.m.—the present timing. The later departure represents the acceleration of the crossing, a final improvement—for the present—having been made in 1895. Prior to that year the timing was:—

Victoria	...	...	dep.	8.30 p.m.
Holborn Viaduct	...	...	dep.	8.30 p.m.
St. Paul's	...	...	dep.	8.31 p.m.
Queenboro' Pier	...	...	arr.	9.50 p.m.
"	"	"	dep.	10.10 p.m.
Flushing	"	...	arr.	6.30 a.m.

Flushing	...	...	dep.	10.10 p.m.
Queenboro' Pier	...	...	arr.	6.25 a.m.
"	"	...	dep.	6.35 a.m.
St. Paul's	...	...	arr.	7.55 a.m.
Holborn Viaduct	...	...	arr.	7.58 a.m.
Victoria	...	...	arr.	7.55 a.m.

Since 1895, the schedule has been:—

	Day Boat.	Night Boat.
Victoria ...	(dep.) 8.30 a.m.	8.50 p.m.
Holborn Viaduct (dep.)	8.25 a.m.	8.45 p.m.
St. Paul's ...	(dep.) 8.26 a.m.	8.46 p.m.
Queenboro' Pier...	(dep.) 9.45 a.m.	10.25 p.m.
Flushing ...	(arr.) 5.15 p.m.	5.0 a.m.

The speed of the London, Chatham and Dover boat trains to and from Queenboro' Pier is, in reality, very fair, as a stop of several minutes must be made at Herne Hill for the coupling up of the City and West End trains.

Distance.		
50 miles.	{ Victoria (dep.) 8.30 a.m. }	Speed, 42.8
	{ Queenboro' Pier (arr.) 9.42 a.m. }	miles per hour.
50 miles.	{ Victoria (dep.) 8.50 p.m. }	Speed, 35.2
	{ Queenboro' Pier (arr.) 10.15 p.m. }	miles per hour.

Moreover, since January 1st, 1899, the date on which the working agreement between the London, Chatham and Dover and South Eastern Railway Companies came into force, the night express stops at Chatham at 9.45, to make connection with a new train from Charing Cross and Cannon Street. The latter train conveys Continental passengers, and is timed as follows:—

Charing Cross	...	(dep.)	...	8.22 p.m.
Chatham (L. C. & D.)	(arr.)	...	9.32 p.m.	

Then again, the night express suffers a further delay at Herne Hill, for in addition to the City train, it picks up through carriages from Willesden to Queenboro' Pier. These through carriages give very close connection with trains to and from the North of England as the following table will show :—

Glasgow	... .. (dep.)	10.0 a.m.
Willesden	... .. (arr.)	6.32 p.m.
Liverpool (Lime Street)	(dep.)	4.5 p.m.
Willesden	... .. (arr.)	8.8 p.m.
Manchester (London Road)	(dep.)	4.15 p.m.
Willesden	... .. (arr.)	8.18 p.m.
Birmingham (New St.)	(dep.)	5.45 p.m.
Willesden	... .. (arr.)	8.18 p.m.
Willesden	... .. (dep.)	8.25 p.m.
Herne Hill	... .. (arr.)	8.45 p.m.
Herne Hill	... .. (dep.)	9.0 p.m.
Queenboro' Pier	... .. (arr.)	10.10 p.m.

Similar through carriages are run on the up journey. As regards through trains from Flushing to various parts of the Continent, a very full service is provided in connection with both the day and the night boats. The night boat, as being the more important, naturally has more trains running in correspondence with it. Three through express trains leave Flushing shortly after the arrival of the night steamer, and their timings and destinations are shewn below.

Train No. 1 is due out of Flushing at 5.15 a.m. and serves North and South Bavaria, the Rhine district, and South Germany *via* Düsseldorf. It is made up of through corridor carriages and a dining car to Bâle *via* Wesel - Strassburg, a through carriage to Cologne, Bingerbrück and Mayence, and a through carriage to Bâle *via* Munster-am-Stein.

Miles.			
	Flushing	... .. (dep.)	5.15 a.m.
207	Cologne (Cent. B.)	... .. (arr.)	12.3 noon
	"	... .. (dep.)	12.15 noon
302	Bingerbrück	... .. (arr.)	2.35 p.m.
322	Mayence	... .. (arr.)	3.38 p.m.
414	Karlsruhe	... .. (arr.)	5.29 p.m.
532	Bâle (Bad. B.)	... .. (arr.)	8.18 p.m.

Train No. 2 leaves Flushing at 5.23 a.m. for North Germany. Dining cars are attached and through carriages worked to Hanover, Hamburg, and Berlin.

Miles.			
—	Flushing	... .. dep.	5.23 a.m.
376	Hamburg	... .. arr.	4.54 p.m.
322	Hanover	... .. arr.	3.12 p.m.
523	Berlin (Friedrich- strasse)	... .. arr.	7.0 p.m.

Both these trains are composed of corridor and lavatory carriages.

Train No. 3 runs as a through express between Flushing and Amsterdam *via*



ARRIVAL OF THE QUEENBORO' STEAMER AT
FLUSHING

Utrecht, and has connections to Belgium and all important Dutch points.

Miles.			
—	Flushing ...	dep.	5.31 a.m.
45	Roosendaal ...	arr.	6.28 a.m.
116	Utrecht ...	arr.	8.15 a.m.
138	Amsterdam (W.P.)	arr.	8.49 a.m.
	„ (Central)	arr.	9.4 a.m.

A fourth train leaves Flushing at 5.45 a.m. for local stations to Breda and Middelburg, etc.

Two trains are run in connection with the day-boat from England, and one of them is a very important express.

Train No. 1 is made up of through corridor carriages with dining-car to Berlin, a through carriage to Leipsic, Dresden, and Vienna (Nordwest Bahnhof), a through carriage to Cologne, and a through carriage to Hamburg.

Miles.			
—	Flushing ...	dep.	5.25 p.m.
322	Hanover ...	arr.	3.12 a.m.
376	Hamburg (Hann. Bahnhof)	arr.	7.11 a.m.
523	Berlin (Friedrich-strasse)	arr.	7.39 a.m.
488	Leipsic ...	arr.	8.17 a.m.
599	Dresden (Neustadt)	arr.	10.52 a.m.
562	„ (Altstadt)	dep.	11.25 a.m.
884	Vienna (Nordwest Bahnhof)	arr.	9.29 p.m.

Train No. 2 is a through fast train to Amsterdam and Rotterdam, which divides at Roosendaal, one portion running thence to Amsterdam *viâ* Utrecht, and the other travelling *viâ* the Hague.

Viâ Utrecht.

Miles.			
—	Flushing ...	dep.	5.33 p.m.
55	Roosendaal ...	arr.	6.49 p.m.
	„ ...	dep.	6.54 p.m.
116	Utrecht ...	arr.	8.55 p.m.
138	Amsterdam (W.P.)	arr.	9.31 p.m.
140	„ (Central)	arr.	9.46 p.m.

Viâ The Hague.

Miles.			
—	Flushing ...	dep.	5.33 p.m.
55	Roosendaal ...	arr.	6.49 p.m.
	„ ...	dep.	6.58 p.m.
77	Rotterdam (Beurs)	arr.	7.55 p.m.
77½	„ (D.P.)	...	8.1 p.m.
91	The Hague ...	...	8.46 p.m.
155	Amsterdam (Central)	...	9.58 p.m.

For facilities of communication by means of through carriages on both sides of the Channel, the Zeeland Steamship Company can challenge comparison with any other service.

Royalty have very often patronised the Queenboro'-Flushing route, the Prince Christian and the Duchess of Albany travelling constantly by it.

The Company are justly proud of the fact that they have never had a serious accident. Their traffic, especially in goods, is still increasing. This fact is self-evident when the two sets of figures given below are compared.

Year.		Tons of Cargo Carried.
1886	...	27,000
1894	...	66,350

The passenger traffic is also going up by leaps and bounds, each year witnessing an advance upon the figures of the previous one.

Year.		No. of Passengers Carried
1876	...	13,000
1886	...	68,000
1897	...	87,000
1898	...	92,000

In busy times it becomes necessary to run special cargo steamers, though the passenger boats are capable of stowing away a very large quantity of freight.

It is the intention of the directors still to adhere to the paddle-wheel type of vessel, as in their opinion boats of that class behave more steadily than screw steamers in the heavy seas occasionally encountered during the winter.

NOTES ON THE RAILWAYS OF HOLLAND

[Hollandsche Ijeren Spoorweg=Maatschappij]

BY ERNEST C. PULBROOK



ENGLAND has always prided herself on being the pioneer of the introduction of railways, and the Briton has always considered that the British railways were a long way ahead of foreign lines in the matter of speed, convenience, and safety. Within recent years, however, he has been growing uneasy, for it has been whispered that the speed of some French trains compared more than favourably with that of many expresses in this country, while even the Fatherland has loudly declared that the station at Frankfort-on-Main is the largest in the world. Then America has taught us many things regarding railways, and when Pullman cars were first introduced people began to see that other countries *could* do things as well as we. Later we heard rumours of marvellous bursts of speeds on various lines between Chicago and New York, but we comforted ourselves with the thought that it was "the usual Yankee exaggeration." All that is now changed, and though many of these reports were apocryphal, the official timings of others were forthcoming, till now it is doubtful to say which of the two countries stands first in the speed of crack trains; but as regards the speed of *all* trains Great Britain can still lead the world. It is the object of this article to call attention to some of those points which strike an observant traveller when journeying through Holland, and which challenge comparison with similar ones in England.

Other countries are improving their railways in nearly every particular, and

great is the improvement in the speed and comfort of travelling in Holland and Germany since the time when I first made the acquaintance of the railways of those countries. But even now the Dutch trains run better and perhaps at higher speeds than do those of Germany. One can always tell when the frontier between these countries is reached, for the Dutch lines are much better laid and more evenly ballasted than are German railways. The train runs smoothly and evenly along the sandy waste at the southern extremity of the Zuyder Zee—the country is so flat that at night one can see the lights from lighthouses on the shores, and ships riding at anchor on the waters of this inland sea—where hardly any sign of life is to be seen, the only inhabitants appearing to be the men who look after the signals along the line, till, just after passing Oldenzaal, it begins to jolt and plunge, and the passenger knows he has reached German soil.

The Dutch railways belong to the State, but are leased to a company to work, and at the end of 1897 there were 2,686 miles of railway open to traffic, which shows that even now the canals are the chief lines of internal communication, and in some parts of the country every railway station seems built on the banks of a canal. Holland is so flat that there is not much in the shape of scenery, as the express trains run along a smooth, straight track almost entirely free from gradients and tunnels—though bridges are numerous—at a speed of between 30 and 40 miles an hour. In the spring the flat-

ness of the country is relieved by the bright patches of the tulip fields. Vogelsang is one of the centres of the culture of the bulb, and all along the line are advertisement boards after the manner of those to be seen along our English lines belonging to some pill proprietor or soap boiler, which tell you that Jan van Middelburg is a florist and dealer in bulbs; and as many of these notices are in English it makes one feel quite at home. The country seems to consist of one huge chess-board set out with squares of every colour of the rainbow, instead of the orthodox black and white. Another fea-



FIRST AND SECOND CLASS COMPOSITE CARRIAGE, DUTCH RAILWAYS

ture of the Dutch railway which has struck me is the cleanly look of most of the stations; the Dutch are famous for their cleanliness, and this is forcibly brought home to a traveller by the extensive way a large firm of English soap makers advertise their wares all along the line; every station, and, seemingly, every signal cabin and every cottage beside the level crossings, bear one or more of these familiar enamelled iron plates.

For years past it has caused me pain to read the "jokes" the comic papers make about our railway stations because they are covered with advertisements; the hapless foreigner is made to say he cannot

find the Mansion House because the stations he has passed are called either "Plum's Soap" or "Bull's Extract of Beef." [In these days of financial jobbery one is afraid of giving a free advertisement in such an influential journal as the RAILWAY MAGAZINE, lest a few thousand shares in some company obtrude themselves on one's breakfast table, and afterwards have to be returned or repudiated.] Thinking it high time that someone stood up for our British railway stations, I have bravely determined to man the breach and state that, as a general rule, the names of stations in this country are placed in a much

more prominent position than is the case in either Holland or Germany, the two countries with which I am best acquainted; and I bear emphatic testimony to the great difficulty there is in finding out the names of the Dutch and German stations without asking someone.

I will recall my impressions of the first journey I made to Amsterdam *via* the Hook of Holland, and leave my readers to determine whether we are so far behind the

Continent in this respect. To start with, the station at the Hook is not at all imposing, and on a dull raw morning is distinctly dismal. All around the country is quite flat, and the direction of the railway can be traced by the line of telegraph posts; the wind whistles through the tall grass and weed which cover the sandy dunes, and the river winds away towards Rotterdam between low, reed-covered banks. The station buildings stand up tall and gaunt, the walls of which are adorned with advertisements of familiar commodities which cause the Briton travelling abroad for the first time to feel he has been led away under false pretences.

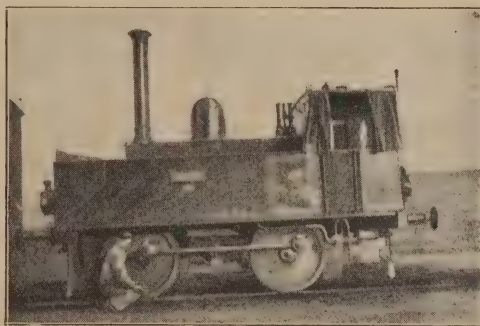


TEN-WHEEL SIDE-TANK ENGINE, BUILT FOR THE DUTCH RAILWAYS BY SHARPE, STEWART AND CO.

This does not make him feel pleased with himself, and the tariff posted about the station notifying the price at which he can breakfast in the restaurant fill him with the keenest resentment, and he determines to starve rather than patronise the "Restauration Maatschappij," which, I believe, is the elegant Dutch term for it. To while away the time till his train starts he turns his attention to his surroundings, and they do not help to make him cheerful if he has but recently recovered from an attack of seasickness and there is a biting wind blowing, a meteorological phenomenon not at all unknown at the Hook. On either side of the platform is a train, one for Amsterdam, Hanover, and Berlin; and the other for Rotterdam and Cologne, but no engine is in sight. He searches the landscape, and in the distance observes the inevitable windmill, while close at hand may be seen a fort or two, and then he seems to have mastered the topography of the neighbourhood. Just as he is supposing the engine has to come from some place situated at the end of that long line of railway stretching

away till it gets lost in the sand, grass, and sky which seem to meet in the far distance, he hears a snort behind him, and a locomotive emerges from what he took to be a sandhill. It is his first experience of a Dutch engine, and he watches its approach with curiosity; it comes snorting and clanking along, running past the train on another set

of rails and then backs into position. Having heard that foreign locomotives are not often famous for symmetry of design he is favourably struck with its neat appearance, and goes nearer to examine it more closely, when all his bad temper vanishes



GERMAN SHUNTING ENGINE, BUILT FOR THE DUTCH RAILWAYS

in a burst of patriotic joy, for he sees that the plate bears the name of Sharpe, Stewart and Co., or Beyer, Peacock and Co.; but, alas! no British driver of a passenger express would like to see his engine in such a state of dirt and grease, and in such sad need of a fresh coat of paint.

It will no doubt rejoice the heart of the patriotic Briton to learn that the majority of the engines used on the Dutch railways have been built by these two firms, but there are also many German locomotives in use, both for express passenger trains and the goods traffic, while the small engines used for shunting purposes



ONE OF SHARPE, STEWART AND CO.'S FOUR-COUPLED BOGIE EXPRESS ENGINES, RUNNING IN HOLLAND

have been almost entirely constructed in Germany. All the British engines are of the four-wheel coupled type, with inside cylinders and driving-wheels of 6 ft. 6 in. or 7 ft. diameter; the Sharpe-Stewart locomotives having a two-wheeled leading bogie, while those built by the Manchester firm have a single leading wheel. The coupled wheels of the latter are 7 ft. in diameter, and the leading wheel 4 ft.; the cylinders are 18 in. in diameter, and have a 26 in. stroke, and the total wheel base is 17 ft. 6 in. The pressure is 150 lbs., and the boiler is fed by two Friedmann injectors,

of the boiler or over the tanks at the side, and, as they carry all their machinery outside the framing, appear as if turned inside out. To complete the picture, there is a huge lamp placed at the base of the funnel, which it rivals in size, and to me it has always appeared a mystery where the men pack themselves. The *Hond* illustrates one of the types of these engines, though in this case the driving gear is placed inside the frame, which causes it to look less clumsy than those with outside cylinders and piston-rod, connecting-rod, and valve gear outside the axle. The

curtains to the cab and the wooden door may be noticed, and also the curious manner of prolonging the side tanks to the front where coal is sometimes piled.

Dutch railway stations are of a peculiar kind. After close observation I have come to the conclusion that either the Dutchman is a most ignorant individual, as he would appear not even to know the name of the place in which he lives, or he is so well travelled that he is acquainted with the name of every station in the kingdom—for the



Photo by]

[F. Moore

DUTCH TRAIN, DRAWN BY AN ENGLISH LOCOMOTIVE,
ENTERING AMSTERDAM RAILWAY STATION

while the six-wheeled tender has a capacity of 2,850 gallons. More engines, with an additional pressure of 30 lbs. to the square inch, and with larger tenders, have been ordered from the same builders.

These British-built engines look quite handsome beside some of those from Germany, especially the tiny ones which clatter and bang and puff about Amsterdam, making as much noise as a whole goods train. These diminutive machines are smaller even than the Brighton "Terriers," are painted black, carry their coal in a bin-sort of arrangement on top

name of the station is seldom or never visible from the railway itself. I say advisedly "from the railway," as in many cases the name appears in large characters *outside* on the station building, evidently so that people who dwell there and suffer from temporary loss of memory can be reminded where they live. For instance, one end of the station building is shown on the left of the general view of Apeldoorn station; in many stations this end will bear the name in large letters just under the roof coping, so that the passenger looking out of the

window just before entering or after leaving the station can see it, but while the train is at rest it is impossible, unless the train is a very long one and the inquiring person is far up the platform.

I was agreeably surprised to find that the first station at which we stopped was called Delft, and I conjured up a mental picture of a town composed chiefly of pottery factories, but I noticed no evidence of this on the platform, and outside nothing but the inevitable windmill and canal were to be seen, so I conjectured that the potteries were some distance away. But

to my amazement the next stopping place was Delft, and the next, and the next! Then I came to the conclusion that something was wrong, and I determined to look more closely into the matter at the next station; soon a windmill surrounded by houses roofed with red tiles came into view and the train slowed, pitched

about as a grinding sound announced that the brakes had been applied, and we drew up in front of a large enamelled iron board with "Delft" in brown letters on a white ground upon it. Yes, there could be no doubt at all about it, "Delft" was the most prominent inscription on the station, so I studied the board, calling all my scanty knowledge of Dutch to my aid, for I noticed there was more lettering on the bottom portion which was enamelled brown with the letters in white. By managing to understand part of the inscription and guessing the rest I solved

the mystery, it was the advertisement of some liqueur! Thus was the vindication of British station advertisements proved to me and I pursued my investigations with zest. At first I was undecided whether the name of the station was "Bluker's Cacao" or "Sunlight Zeep," as those were the next most prominent names to be seen at every stopping place, and, as there was evidently such marked uniformity in place names in Holland, it did not surprise me that they did not post them more frequently, but eventually I came to the conclusion that these must be adver-



VIEW OF APELDOORN RAILWAY STATION, HOLLAND

tisements also, and "Zeep" the Dutch for soap. [This was comforting, to an extent, as poor benighted stay-at-home Britons are often told that soap is an unknown commodity abroad.] The names of the stations were not displayed on every lamp, window, seat, or on boards as is the case on most British lines, and I am certain that no Dutchman travelling in England would have much difficulty in finding out the name of a station in spite of the many advertisements posted about the walls. By looking at the general view of Apeldoorn station a "Sunlight

Zeep" advertisement may be seen just over the barrow standing by the wooden paling at the left-hand side of the lamp.

I was also rather struck by the peculiar fact that in many cases the train made a tour of the station before deciding where to enter; you would look out of the window and begin to feel alarmed, as there was the train making straight for the entrance of the cloak-room. While you watched, fascinated by the problem as to whether the locomotive would manage to scrape

There are one or two excellent stations in Holland, the Central station in Amsterdam being a fine building, with a large single-span glass roof like St. Pancras; it is situate in a large open square almost at the side of the River Y (an arm of the Zeeder Zee), which can be seen just beyond, and stands practically on an island. It has three platforms, the centre one being an island, and a good idea of its situation and the fine façade it shows to the street may be gathered from



VIEW OF THE CENTRAL RAILWAY STATION, AMSTERDAM, FROM THE WEST

through the door without losing its funnel, the train would suddenly swerve aside, run round the building and proceed towards the main entrance from the street. Before you had recovered from the shock this strange intention of the driver had given you, you would be entering the station at the end a train usually does in a civilised country. I presume this idea of waltzing round a station before entering it is to show strangers the name of the stopping place when it is on the street side of the building!

the annexed illustration. It is lighted with electricity, and the corridors and booking-hall are lined with glazed tiles, and it contains the necessary waiting-rooms and dining halls for all classes. The goods yard contains the usual carriage sheds and goods warehouses, and there is a large circular engine-shed, which contains accommodation for all locomotives working in the neighbourhood. Being so near the river and the docks the facilities for the rapid shipment of goods can easily be estimated.

An advantage the Dutch stations have over German ones is that the platforms are raised, while they are practically level with the ground in the neighbouring country, the only exception I have met with being at Harzburg, a fashionable watering-place in the Harz Mountains. The view of Apeldoorn illustrates a typical example of the ordinary railway station in the Dutch provincial towns; it also shows the method of signalling in vogue in Holland, and the different type of signal-discs used for cross-over roads, and those giving access to the sidings. The high, round discs, about six feet high, are used for the latter purpose, and are usually painted

and a white light at night. As these discs are nearly always locked with the points, no accident can occur unless the driver makes a mistake and accepts a signal against him.

The stations seldom or never have cross-over footbridges; passengers wishing to cross from one platform to the other use level crossings placed at one or both ends of the station. The method of spreading out the lines when entering a station, which gives so curious an impression to the traveller, is also well illustrated at Apeldoorn, where the platform stands in a direct line with the railway, so that the train has to run aside when passing



ENGINE SHED NEAR THE CENTRAL RAILWAY STATION, AMSTERDAM

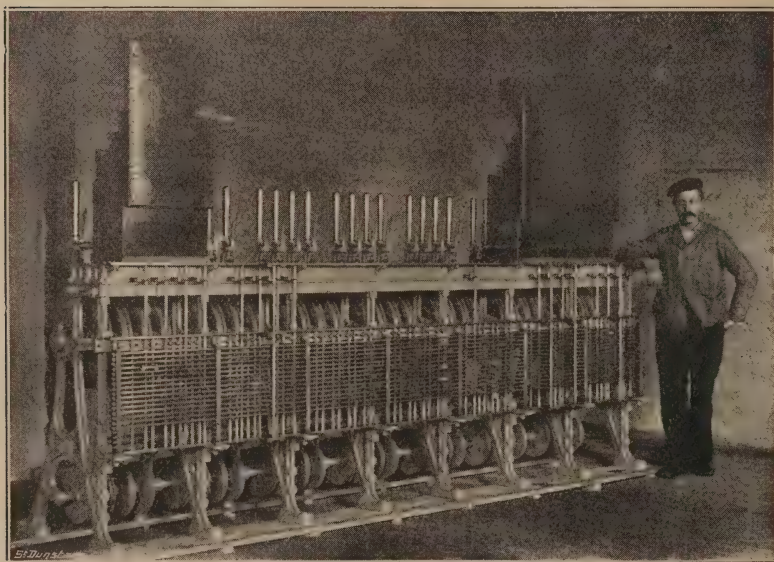
white on one side, with a small hole in the middle for the lamp which is placed in it after dark. The cross-over point discs are quite low—not being more than a foot high—of a diamond shape, and are also painted white, while the reverse is black. These work somewhat after the following manner, so far as I have been able to gather by watching them when in use:—When the through line is clear for a coming train, and the cross-over points are closed, the white disc stands with its face to the line, showing its edge to an on-coming train by day, and a tiny red light at night. When the points are set for a shunting train, the disc shows its white side to the driver,

through the station, and it will be observed that the platform is narrower at one end.

Dutch railway carriages are comfortable, but have an air of stuffiness about them. The seconds are nearly as good as the first, but I never remember having seen a cushioned third-class carriage, and apparently but few through thirds are run, as, when travelling by some of the trains from Amsterdam or Rotterdam to Osnabrueck and Hannover, I have noticed that at every junction half the carriages seem to be taken off, and fresh ones put on, while the passengers get out of the old ones only to enter the new. Smoking is

permitted in all carriages, unless marked "Not Smoking" (*Net Rookten*), or a label is attached stating the carriage is reserved for ladies; but as I have never travelled in a ladies' carriage, I suppose I cannot speak for them, as they may smoke, considering everyone seems to indulge in the habit in Holland. For the purpose of communicating with the guard, each carriage contains a handle, which applies the automatic brake when moved. This is usually placed in the middle, just above the cushions, with a card of instructions for use at the side: and to prevent misuse

when not in use, which can be utilised if one wants a meal on the journey. The top panels and ceiling are covered with Lincrusta-Walton, and just below the hat-racks are mirrors. The seats in these trains are numbered, and one is supposed to pay a shilling or two for the privilege of keeping one; but I have not always had to do so. Most of the third-class carriages are built on the usual compartment system, but are not generously supplied with windows, nor do the seats boast cushions; and in most respects they are not better than the older coaches



BACK VIEW OF SIGNAL APPARATUS USED ON THE DUTCH RAILWAYS

it is sealed, so that no one can move it without first breaking the seal. Very comfortable composite first and second-class corridor coaches are in use between Amsterdam and Rotterdam, and Berlin and Cologne. They run very smoothly on two four-wheeled bogies, and, being entered from the end, are free from draughts. For sleeping during the night the seats pull out, and the cushions slide down, and form a fairly comfortable couch. Just below the window between the seats, where the door would be, are folding tables, fitting close to the panel

on some of our much abused Southern lines. All trains are fitted with the usual air and hand brakes, and are lighted by gas or oil, the majority of carriages having only oil lamps. A curious type of carriage is seen drawn up at the platform of Apeldoorn station, which the passengers enter by means of a covered, tram-

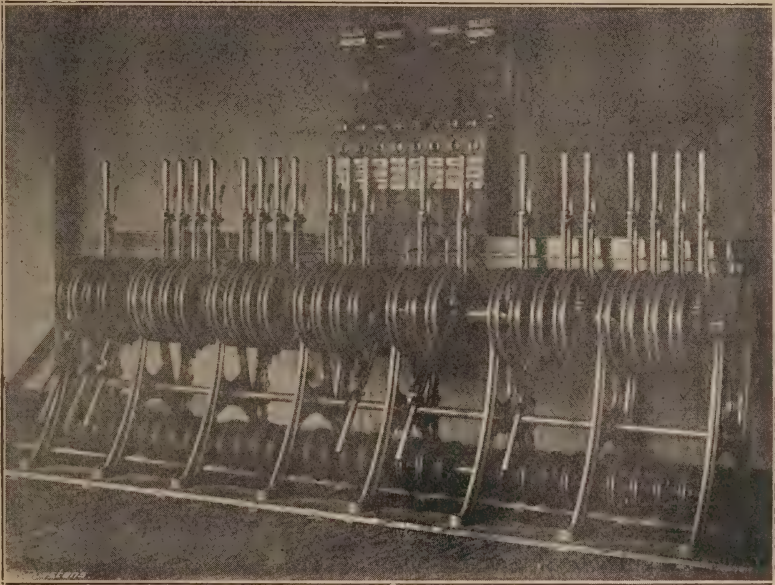
car-like platform at one end.

The Dutch railways are worked on the usual block system, but the method of interlocking all points and signals has not reached so high a state of efficiency as on the chief railways of this country. Most of the signal arms are of a curious design; they are of the usual rectangular shape, but which broadens out into a circular disc at the end, which can be seen by studying the signals in any of the accompanying illustrations; two illustrations showing a front and back view of a set of signal levers will also be found. Most

of the signal cabins and cottages at the side of level crossings are numbered, and when the train passes the signalman stands outside at attention holding a flag—red, white, or green as the case may be; and I have even seen a pole alone without any flag whatever. It sometimes happens that the man himself is away or is busy indoors, and in that case his wife stands outside with the flag to show that all is right and there is someone at the post. The level crossing barriers are usually of a very primitive character, being simply a long pole supported by two uprights which is placed in position by hand, though, if the road is a broad one, a more elaborate device is used, and some mechanical method is adopted for placing it in position, and now and again gates are to be met with.

On the whole railway travelling in Holland is fairly comfortable for the first and second classes. Practically all the long-distance trains have through carriages fitted with lavatory accommodation; but the third class passengers do not fare so well, there being but few bogie coaches, and not many thirds are run for long distances, so that frequent changes are necessary. The track is well laid and the running is fairly smooth. The speed of the expresses is about 40 miles an hour, with an occasional burst of even higher speeds; but the local trains mean-

der along from station to station, making long stops at junctions, and not over much trouble is taken to cater for the convenience of the public in such matters as making connections with branch lines without vexatious waiting. Regarding the trains run in connection with the English boat services from Harwich and Queenborough, the through trains from Amsterdam to Berlin, and the trans-continental express from Milan to Amsterdam, show the best timings; the fastest run of the latter being between Emmerich and Amsterdam, a



FRONT VIEW OF SIGNAL MECHANISM, DUTCH RAILWAYS

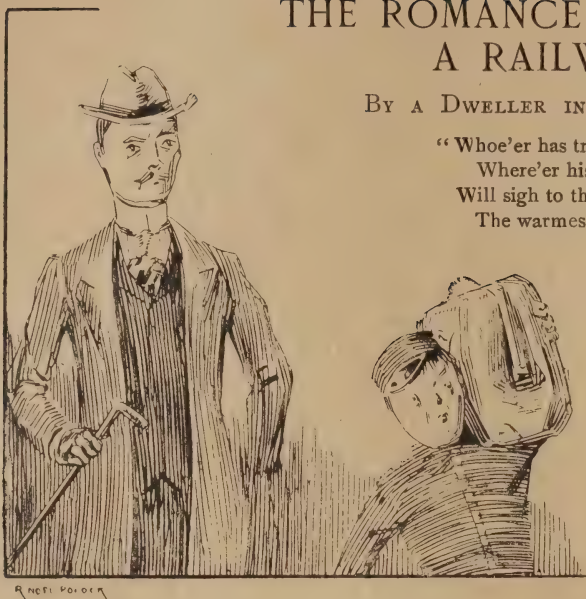
distance of 77 miles. There are stops at Zevenaar, Arnhem, and Utrecht, and the time allowed for the 37 miles between the two latter places is 46 minutes, though it is often done in less if the train is late. The fastest train takes nine minutes under the three hours to reach the frontier at Oldenzaal from Amsterdam.

For the photos with which this article is illustrated I am indebted to the courtesy of the Dutch Railway Company who kindly supplied me with them.

THE ROMANCE AND HUMOUR OF A RAILWAY HOTEL

BY A DWELLER IN A LONDON CARAVANSARY

"Whoe'er has travelled life's dull round,
Where'er his stages may have been,
Will sigh to think he still has found
The warmest welcome at an inn."



or idling in the skittle alley at the back of the old English garden, bore witness to the generous quality of mine host's home brew, or his "pineapple rum, hot."

But where, alas! is the picturesqueness, where, alack! the romance to be associated with the many-storied brick structures, with impossible windows staring one out of countenance with their dead-level of mono-

tonous architecture. The ostler and the boots, the square courtyard with its verandah, the tapestry-room and four-post bedstead, the spit, the dog, and the seat in the ingle-nook, are as extinct as the dodo—ruthlessly swept away before the onward rush of that civilization which reduces romance to common-place dullness, and is death to all picturesque individuality.

Even so modern a ghost as Dickens would fail to recognise in the silk-hatted, frock-coated gentleman of to-day—scarcely known to his visitors, if by chance they meet him in the corridors or hall—the evolution of the old-fashioned landlord, who, a generation or so back, entertained his guests and personally saw after their comfort.

Well, we plead guilty to this stern indictment. Nevertheless, the spirit of romance is not wholly dead, though it may manifest itself nowadays under new forms, dressed in more modern guise; and if the following few reminiscences

THE question may be asked: What possible romance can exist within the four walls of a modern hotel?

In the days of post-boys and knights of the road, when a man was wont to make his will before taking coach from London to York; in the stirring, free-and-easy times Charles Dickens was the last great novelist to immortalise—one can well imagine the romance that clustered round hotel or wayside inn, and all the picturesqueness attendant upon "mine host," stout, jovial, and rubicund, or that furnished a setting for his buxom and good-natured spouse, and apple-cheeked daughter.

At the door of his ivy-crowned hostelry, with the sign of "The Maypole" or "The Spotted Dog," flapping in the breeze, stood Boniface, with shining face and sturdy legs well apart—the outward and visible sign of the inward good cheer; whilst the mellow countenances of those jolly loungers round the jessamined porch,

have no other merit they are at least true, forming as they do a part of the writer's personal experience extending over a period of nearly twenty years.

A railway hotel has this advantage over other establishments of similar character: there is a greater variety and more

timid traveller from seeking repose at these luxurious lodging-houses. Such people are of course not sufficiently insane to be put under lock and key; but many hotel guests display such extraordinary idiosyncracies that the management is frequently put to a variety of shifts to get rid of them.

One highly educated and very wealthy man, who periodically resides in hotels, has a trick of never passing any object that appears to him out of its right position. He will carefully adjust the pictures on the walls of the public rooms, replace chairs that have been left at inconvenient angles, re-arrange stationery in the rack, and carefully shut-to every open door that catches his fastidious eye.

No doubt there is some brain lesion, some over-balanced faculty of order which exaggerates trifles and converts molehills into mountains of distortion that prove to other men no source of irritation.

The most insane individual, however, who probably ever stayed for a lengthened period in one hotel, was a foreigner of most eccentric ways. Whether money matters had turned his brain was not quite known, as most of his life was associated with mystery. One day he would pull out rolls of banknotes from his pocket, the next he would appear penniless. Indeed, he reminded one of a stanza from a comic song which told of a man familiar with the ups and downs of fortune:

"One day he's collectin' his five-pound notes,
The next he's a countin' his browns."

Conceiving the strange fancy that he was the victim of a gigantic financial swindle, this unfortunate gentleman imagined he was being constantly shadowed by emissaries of the Government. Indeed, to his poor deluded brain, it was the Treasury itself that interfered with his designs and persecuted him "even unto strange cities." He would lock his door, and take elaborate precautions against a surprise visit from the Chancellor of the Exchequer, or his satellites.



R. NOEL POLOCK

"He will carefully adjust the pictures on the walls."

kaleidoscopic change. The advantage, needless to say, has reference to one's opportunities for studying character; the hotel authorities would prefer a more equal and sustained style of business.

First, it may be remarked that an astonishing number of mad people reside in hotels. Let not this statement deter the

His favourite custom, perhaps, was to single out some singularly harmless individual in the smoking-room—say, a country clergyman, or provincial mayor—and challenge him with being a Government spy. So objectionable did his behaviour at length become that he had to be turned out of the house—a proceeding that had to be conducted with no little stratagem and guile. Eventually the poor fellow died in an asylum.

This is an extreme case. One less sad is that of a lady of independent means whom we will be polite enough to describe as eccentric. "Not very handsome, and not very young." She was extremely vain; and her self-consciousness always suggested that every male in the vicinity of her presence was "making eyes" at her. Even the waiters in the coffee-room were not held blameless in this respect, and this worthy dame on more than one occasion reported a modest young fellow, guiltless of any rudeness, for staring at her during dinner.

Leaving mania to the specialist we are confronted with eccentricity, and the person with "nerves"—the highly-strung emotional man, suffering mayhap from dyspeptic troubles, or a too-close application to sedentary pursuits.

One such—a most estimable man, came very near to being associated with a tragedy. He occupied a room on the fifth floor, and suffered from insomnia. One night the ticking of the clock on the

mantelpiece annoyed him. Presently it got on his nerves. He might have adopted some less drastic method, however, for dispensing with the cause of irritation than he employed. A choice of ways and means was open to him. But this gentleman had a turn for melodramatic situation. He neither put the offending clock into the wardrobe nor deposited it on the mat outside his door. He did not turn it topsy-turvy and shake it, nor threw himself in a wrestling attitude upon hands, or mainspring, or pendulum. Oh dear no. He took hold of that clock firmly, with the wrapt far-off gaze of a Jephtha or a Virginus. Clad only in his sacrificial robes—in other words his night garments—he approached the head of the principal staircase and solemnly slung that "eight-day dial" over the banisters, down the open way, encircled by half a dozen precipitous flights



"Challenge him with being a Government spy."

of stairs. Gathering momentum, it crashed with terrific violence upon the mosaic pavement of the hall below. It was sublime, but risky. So at least the night-porter thought as he sat down to consider the conflicting claims of one or two rival life-assurance offices. Meanwhile this modern Jove, who hurled up-to-date thunderbolts, had skipped back to

bumptious, shoddy sort of individual was hectoring the official referred to.

He was using bullying tactics, and for the benefit of a few idlers on the settee in the hall he raised his voice. *He* hadn't knocked about the world for nothing—he knew what first-class hotels were, having patronised them from China to Peru. *He* was known all over the Continent and

America, and *he* wasn't going to be either bamboozled or neglected. Evidently the head porter didn't know his business, etc., and so on, in the same magnificent style.

The hall porter, who was a very independent character, quietly looked the speaker up and down, and answered thus: "I've been connected with hotel life for thirty years, Sir, and, in my younger days, d'you know that only gentlemen used to frequent first-class hotels. But now," he went on impressively, "second-rate bagmen, shop-walkers, linen-drapers' assistants, greengrocers, retired publicans, gentlemen's butlers—"

Whether any one of the descriptions fitted, history does not say, but the shoddy guest did not stay to listen to the conclusion, or to join in the roar of laughter that issued from the settee.

A point at repartee of a similar character to the last was made during an altercation between

bed and slept the sleep of a man who had justly earned repose.

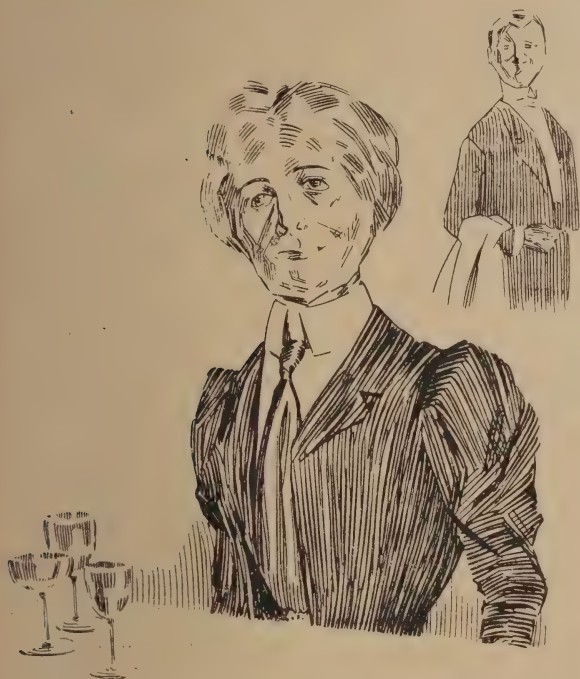
The next morning profuse apologies were offered, and the clock paid for. The excuse shaped somewhat after this style: "The ticking annoyed me and prevented me from sleeping. I know I did a *very foolish thing*, but it was the only remedy that occurred to me for the moment."

An incident connected with a hall porter may have passing interest.

It was late in the evening, and a very

two guests one day in the smoking-room. The origin of the squabble is lost in obscurity; but, after mutual recriminations, one of the disputants turned to go. The other called after him; "Bring us the latest quotation for pigs when you come again." To which the first returned, with a bow: "My dear Sir, I am no more a pork-butcher than you are a gentleman."

The point scored is, of course, as old as the hills; but the application is ever new, and never fails to rankle in your adversary's breast.



R. NOEL POLOCK

"She was extremely vain."

The reader must not form the impression that a first-class railway hotel is often the scene of quarrels or actions in doubtful taste, though we have seen in the dim small hours of the morning two highly respected guests rolling about on a large square of Ottoman carpet in the hall, engaged in a heated tussle that could hardly be described as the Graeco-Roman style. No doubt those two worthy citizens felt deep contrition when morning light dispelled the illusions of the previous night's revel. Such little pleasantries are merely by the way, and what the *sketch* artist would term "the light side of nature." They pass unrecorded, and only the cynic would take the trouble to unearth them.

Two suicides in hotels have come under the writer's notice. One was fatal—an elderly man making a clean job of it by blowing out his brains. Possibly the servants of the establishment held another opinion as to the cleanliness of the operation. But it remains a curious fact for statistic-hunters to explain that a hotel is not infrequently chosen by suicides as a fitting arena for life's last great tragedy.

The second case was that of a young man who had taken an overdose of morphia. His plans were carefully thought out. Disgusted with the world, he paid visits to various chemists in London, purchasing small quantities of the drug from each. Returning to the hotel where he had previously booked a room, he secured the privacy of his apartment, wrote a farewell letter to his friends, dosed himself, and retired to bed. *Mais l'homme propose et le Dieu dispose.* This self-murderer, with his desire for dramatic fitness, rather overdid the business. He ordered breakfast for the following morning, registering his call with the night-porter for seven o'clock. This may have been mere bravado, or a last exhibition of gruesome humour he alone was in a position to chuckle over. His drollery, how-

ever, saved his life, for the porter duly calling him in the morning, and receiving no answer to his knock, grew anxious, and finally alarmed. After banging at the locked door loudly enough to rouse the whole corridor of sleeping inmates, he hurried downstairs to ask instructions from the clerk-in-charge. The upshot was the door was forced, when this interesting young man was discovered unconscious, but still alive.

Medical aid was obtained, and the would-be suicide hauled out of bed on to the floor. After six hours of violent treatment, comprising mustard emetics, hypodermic injections, the cold douche, slappings and buffetings, and marchings up and down—during which period four strong servants of the household were worn out with incessant exertion—the patient was recalled from the valley of the shadow of death, and finally recovered.

Afterwards he politely thanked his rescuers, but expressed the keenest regret that he had not been left to carry out his original intentions.

The carelessness of many hotel guests in relation to their belongings is proverbial. But the cool suggestion of one gentleman deserves recording. "I know," he remarked testily to the reception clerk, during one of his visits, "I know I generally leave things behind, and your people ought to watch me to see that I don't forget anything!"

Another fussy old visitor, after enquiring whether he had left his tobacco-pouch behind, and receiving through the post a reply in the negative, wrote back to say he should put the matter into the hands of the police and inform the *Times* about it!

This article might be lengthened indefinitely; but perhaps enough has been penned to show that neither tragedy nor comedy is lacking behind the plate-glass doors of the modern establishment that is the outcome of the time-honoured inn.

SHEFFIELD DISTRICT RAILWAY

By T. BOOTH



OBSEVANT people travelling from the North to the South by the Midland Railway have noticed during the past few months growing signs of a new railway enterprise which terminates at the north-eastern extremity of the vast manufacturing city of Sheffield. This is the new Sheffield District Railway. Great strides

ning the river bear eloquent testimony to the fact that another railway is nearing completion. All that remains to be told is the districts which the new venture will serve. Considering what the scheme will mean to Sheffield, it is surprising to find what ignorance prevails concerning the short arm of railway which stretches from Treeton, on the Midland (Chesterfield, Masbro', and Rotherham Line), to Bright-

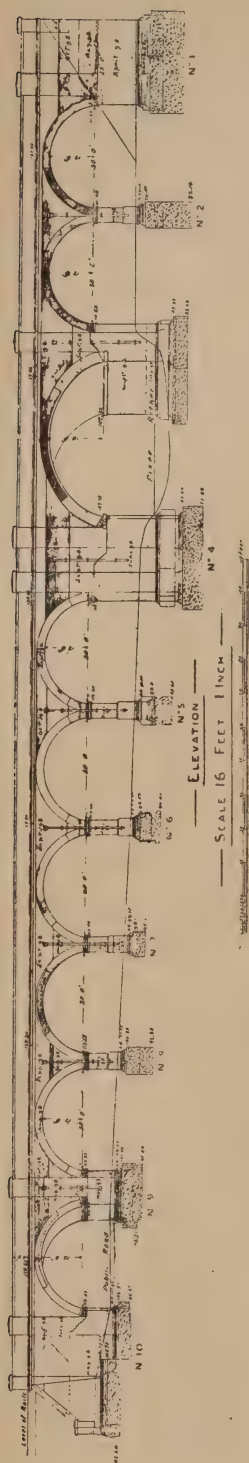


MAP SHOWING THE SHEFFIELD DISTRICT RAILWAY, THE LANCASHIRE, DERBYSHIRE AND EAST COAST RAILWAY, AND OTHER RAILWAYS AROUND SHEFFIELD

have been made with the works since the scheme was first mooted, and the waste piece of ground, bounded by the river Don on one side and Attercliffe Church on the other is beginning to assume a more tangible and explanatory appearance. There is no need now for the enquiring Midland passenger to ask what all the various operations mean. The permanent way and the new bridges span-

side, on the main line of the Midland Railway from Leeds to Sheffield. The shortness of the venture may have something to do with the indifference which has been shown to the new project; but this apathy will be swept aside as soon as the Sheffield District Railway is opened.

The scheme is too important to be judged by mileage or cost. It means very much more to manufacturers and



THE CATCLIFFE VIADUCT, SHEFFIELD DISTRICT RAILWAY

pleasure seekers than appears on the face of it. When the works are completed, Attercliffe will have a large goods depôt right in the heart of the largest steel and iron works in Sheffield. Access will be given to three railway companies, who will be enabled to come with their own rolling stock to fetch away the heavy products manufactured in this part of the city. Perhaps the greatest advantage to Sheffield is the fact that the Great Eastern Railway will have a direct connection with the town. This, in itself, will be a distinct gain. At the present time many "railwayacs" consider that there is no more enterprising railway than that which makes its headquarters at Liverpool Street Station, London. Given direct access to a town which it has long been striving to

enter, we may rest assured this mighty railway corporation will not allow the grass to grow under its feet. It has already made extensions to Doncaster, and more recently another arm from this octopus line shot out in a north-westerly direction over the Lancashire, Derbyshire, and East Coast Railway from Lincoln to Chesterfield. The Sheffield District Railway will enable them to tap the enormous traffic which awaits collection at its terminus.

The new line will be worked by the Lancashire, Derbyshire, and East Coast Railway. And here it should be mentioned what new fields for pleasure are opened to the toilers of Sheffield. True, the Dukeries have long been known for their charming and magnificent beauty; but there has not been direct access to them. It will be possible in a very short time to take train at Sheffield and travel direct to Edwinstowe and the stations which fringe the heart of Sherwood Forest and the other "show places" in the Nottingham ducal district. It is not so long ago that the new line from Chesterfield to Lincoln was opened; but the beautiful districts it touches are daily becoming better known to those who find their pleasures "in the pathless woods." This year will witness a much greater influx of visitors by rail to the station which lies in close proximity to the "Major Oak."

The Sheffield District Railway, as it now stands, consists of a railway about four miles in length. It commences at Treeton and finishes at Attercliffe. Both the Lancashire, Derbyshire, and East Coast and the Great Eastern Railways will have running powers over the Midland Company's line from Bighton Junction (the northern point of the Lancashire, Derbyshire, and East Coast Railway) to Treeton. There they will branch off over the Sheffield District Railway to Brightside. Joining the Midland line again at this point, they will have to run for about half-a-mile to the Attercliffe Goods Yard for



BRIDGE CARRYING THE EXTENSION TO SHEFFIELD OF
THE LANCASHIRE, DERBYSHIRE, AND EAST COAST
RAILWAY OVER A PUBLIC ROAD

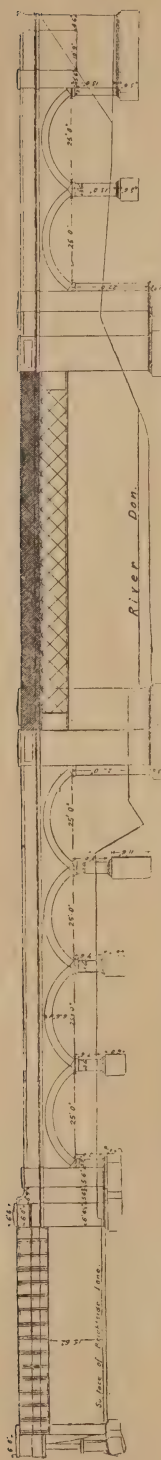
goods traffic. The passenger traffic will be conveyed forward into the Sheffield Passenger Station of the Midland Railway. The goods yard at Attercliffe will be provided with good warehouse accommodation and crane power for dealing with heavy iron work, &c. Ample arrangements will also be made for dealing with cattle, &c. The cost of the undertaking will be very great. Extensive excavations have had to be made, and a great number of bridges erected. The site on which the Goods Station stands has been greatly altered from its original surroundings. The course of the river Don has been diverted twice, and the sides of the stream walled. It has also been necessary to raise the ground by at least twelve feet, and considering that the station covers an immense tract of land, this has

been no slight undertaking. The diversion of the river involved the removal of 40,000 cubic yards of material, and the new walls to the river Don represent 2,200 cubic yards of masonry and 1,200 of brickwork. 4,500 cubic feet of pitch pine has been used for piles under the walls, the abutments, and piers. There will be three entrances to the station. The main approach will be by Stevenson Road, another from Faraday Road, and a third from the corner of Princess Street and Savile Street East. This last mentioned has involved a new road under the bridge of the

Midland Railway, and a siding will be laid for the convenience of the large firms in Savile Street. Provision has also been made for extending the warehouse at anytime. When the enlargement proves necessary, the superstructure will only have to be added. The foundations are already laid. As the Attercliffe dépôt may occasionally be used for passengers, a platform is being built for their convenience. Stevenson Road will run right through the station premises to Brightside Lane. It crosses the Don by means of a fine bridge, having two spans, each of



A GIRDER VIADUCT ON THE LANCASHIRE, DERBYSHIRE, AND EAST COAST
RAILWAY EXTENSION TO SHEFFIELD, IN POSITION PREVIOUS
TO THE EMBANKMENTS BEING CONSTRUCTED



THE BRIGHTSIDE VIADUCT AND BRIDGE OVER THE RIVER DON, SHEFFIELD DISTRICT RAILWAY

45 feet in width. Close beside it is a similar bridge carrying the railway. It was expected that the goods yard would be opened about last Christmas. The works, however, are not yet quite completed, and it will not be opened for traffic for a month or two.

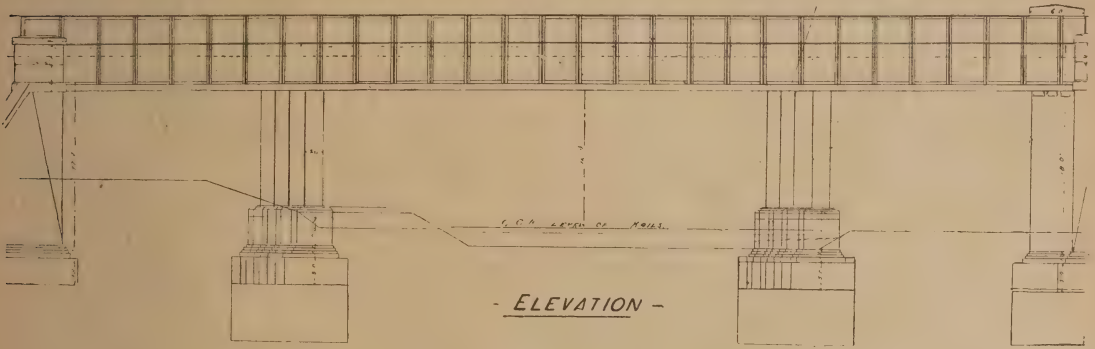
The arrangements for running passenger trains direct to the Sheffield passenger station of the Midland Company will prove a great boon to travellers. People from the north, south, and west will be able to change direct from the Midland trains into those of the Lancashire, Derbyshire, and East Coast Railway. This should be a great inducement for many visitors to come from the large industrial centres—such as Manchester, Liverpool, Leeds, Bradford—to the Dukeries. It will also open up a new route *via* the Lancashire, Derbyshire, and East Coast Railway and the Great Eastern Railway for the Eastern Counties and the Continent *via* Harwich. The new railway will also give the Great Northern Railway Company two new routes into Sheffield, one from Tuxford on

their main line, and the other *via* Langwith Junction and Lancashire, Derbyshire, and East Coast Railway and their new Leen Valley Line.

The Railway from Treeton to Brightside is not so well advanced, and it will be Autumn before it is finally completed. Much delay arose through difficulties which presented themselves in arranging terms with the owners of the land. Once these were settled, however, the work has been pushed on without delay. The line leaves the Midland Railway five or six chains past Treeton Station, and is carried along an embankment, which is succeeded by a viaduct at Catcliffe. The River Rother is crossed by an arch of 40 feet span. After another length of embankment a deep cutting and a tunnel 80 yards in extent carries the line beside Tinsley Wood. Good progress has been made with the works during the last six months, and the engineers report that over a quarter million cubic yards of excavation have now been got out. Catcliffe Viaduct is completed with the exception of the parapets; and that portion of the Brightside Viaduct on the east and west sides of the river are finished with the exception of the parapets. The spans over the River Don and Public Road are ready for ironwork. Five bridges are now completed, four are ready for the ironwork, and the remainder are progressing favourably. The stations at Catcliffe and Tinsley are likewise well in hand. In passing, it should be mentioned that Earl Fitzwilliam is said to be about to develop the neighbourhood of Brinsworth; and a station erected at this point will do much to aid the noble earl in his efforts to make the district into a working-class suburb. After leaving Brinsworth there is an embankment until a road near Tinsley is reached. This has had to be bridged over, and iron spans carry the railway over the canal, and the Great Central Company's line to Rotherham and Barnsley. Sidings are being

made into Jessop's and Cooke's works, and a station will be erected at Tinsley. From this point an embankment carries the line across the intervening fields to Brightside. The River Don and Meadow Hall Road are bridged with iron, and a very short length brings the District Railway on to the Midland. It has been necessary for the latter Company's lines to be widened to make the junction with the new lines. A large tip will have to be practically cleared away, and this will mean shifting at least 20,000 cubic yards of *debris*. Girder bridges over Newhall Road and Brightside Lane, and two arches of 25 feet span over Sanderson's Mill Race, bring the line into the Atter-

At the half-yearly Meeting held in February, Mr. W. Bromley-Davenport, M.P., said that it was expected the Great Northern Railway would use the line as soon as the Leen Valley extension was completed. This extension would bring the Great Northern in connection with the Lancashire, Derbyshire and East Coast Railway at Langwith, where direct access to Sheffield would be obtained *via* Clowne and Killamarsh. It was decided at this meeting to create and issue new 5 per cent. preference shares to a nominal amount not exceeding £100,000, and of additional debenture stock to a nominal amount not exceeding £33,000, to carry interest at a rate of not more than 4 per



STEEL GIRDER BRIDGE CARRYING THE SHEFFIELD DISTRICT RAILWAY OVER THE GREAT CENTRAL RAILWAY

cliffe Goods Yard. As regards this station much progress has been made during the last half-year. The ballasting and metalting of the yard, also the laying of the sidings, are now practically complete, and only require the connection to the Midland Railway at Grimesthorpe. These works are being pushed rapidly forward by the Midland Company. The other details necessary to the completion of the goods yard are also nearing finality; but the erection of the warehouse has been somewhat delayed, pending the delivery of the ironwork. The cattle pens, horse and carriage loading docks, as well as the weighbridges and offices, also show satisfactory progress.

cent. per annum. The directorate includes the names of some well-known business men, and it is pretty safe to prophecy that with the aid of such powerful companies as the Midland and Great Eastern the Sheffield District Railway, when finally completed, will open its lines under most favourable conditions. It taps that part of Sheffield and district where the heaviest traffic is to be secured, and the revenue from this source alone should be considerable. The line is also certain to be popular with the toiling masses of Sheffield, as it will bring them into immediate touch with magnificent ducal residences and scenery that has few equals in the immediate neighbourhood of the City on the

Don. We may rest assured that Mr. H. Willmott, who so ably presides over the destinies of the Lancashire, Derbyshire and East Coast Railway, will leave no stone unturned to bring the claims of the combined undertakings to the notice of the Sheffield public. With

this short length of railway, Mr. Wills has also some very important contracts in other parts of the country. Amongst these may be mentioned the Dock Works at Barry, the Dock Works at Heysham for the Midland Railway, and the Dock Works at Liverpool for the Mersey Dock



BRIDGE CARRYING THE LANCASHIRE, DERBYSHIRE, AND EAST COAST RAILWAY OVER A
COLLIERY LINE AT WORSOP (THE CONNECTING LINE IS SHOWN ON THE RIGHT)

this end in view, and anticipating an early completion of the line, offices have already been taken at 90, High Street, Sheffield.

The contractor for the work is Mr. C. J. Wills, of London and Manchester. In addition to the work now well in hand on

Board. Another most important piece of work is the widening of the Midland Railway between Sheffield and Dore. Mr. Wills is also engaged on the Ealing and Harrow Railway, and the Shirebrook Curve on the Lancashire, Derbyshire and East Coast Railway.



THE NEW COMER

(SEE "BRADSHAW," MARCH 1899, p. 535a)

THERE's a flutter at St. Pancras, there's a
bustle at King's Cross,
They are posting bills and tearing time-
sheets down,
There's uneasiness at Euston in the office
of the "boss"—
For the Central is a-coming up to
Town.

They spoiled the Rugby polo-ground, they
cast their eyes on Lord's,
They bridged the great Nor' Western's
four-fold track,
They tapped the Midland's coal pre-
serves: and now it's on the boards
"From Manchester to Marylebone and
back."

On the crowded lines of Derby, 'mid the
busy towns of Notts,
Thro' the villages and pastures of the
shires
There's another whistle sounding; and to
snug secluded spots,
They are sending TRAIN ON LINE along
the wires.

Then *let* them come with all their strength!
we're ready for a race,
Be it dining cars, or cattle, fish or coal;
* Green, Red, and Black, we're waiting;
let their monsters make the pace,
And three of us will race them to the
goal.

For it's hard to beat the Northern when
the eight-foot single hums,
And the Midland racers "fly" in spite
of weight,
And it's hard to beat Nor' Western, when
a big Crewe compound comes
With just a dozen bogie-cars for
freight!

So clear the line before us, drop your
signal, set us free!
We are "blowing off," and chafing at
delay;
And let the Central do its best, the country
soon shall see
Which one of us will show the rest the
way.

A. B. S.

* *i.e.*, Great Northern Railway, Midland Railway, London and North Western Railway Engines.

SOME WONDERFUL LITTLE ENGINES

BY CHARLES ROUS-MARTEN

(Continued from page 212)



COMING now to my own personal experiences of the work done by these 6 ft. 6 in. coupled engines—"Precedent" class—on the London and North Western Railway, I may remark that even my earliest acquaintance with them afforded excellent promise of the good things that were to come later.

Returning to England early in 1884, after an absence of some years, I found the number of original "Precedents," viz. 70, complete, and the locomotives themselves an established success. My initial trip was behind "Hercules" No. 1105, which at that time usually ran the 12 noon Manchester express from Euston to Rugby, then timed to make the Willesden-Rugby run in 91 minutes for the 77 miles. "Hercules" did it easily in 88 min. 35 sec., easing down toward the end. The load, it is true, was only ten six-wheelers, but the work was very creditable throughout. Subsequently the same engine did this run with eight coaches in 86½ minutes, and with eleven in 87, when the booked time had been quickened to 88 minutes. Returning from Rugby on the first occasion another engine of the same class, "Sir Hardman Earle," No. 890, on the up Manchester express, ran to Willesden in 93 minutes with the enormous load of 20 coaches, weighing fully 240 tons, behind the tender. What was specially noteworthy about this performance was that it was not accomplished by extreme speed downhill. In no case did the maximum rate exceed 60 miles an hour down either

the Roade or the Tring bank, while the 15¼ miles from Bletchley to the Tring summit occupied only 19½ minutes. This struck me as a singularly fine achievement for so small an engine, having only 88 lbs. of tractive force for each lb. of steam pressure on the pistons, and weighing only 32¾ tons.

Later, in 1884, "Stewart," No. 1189, with the Birmingham express, timed to reach Bletchley in exactly one hour from Euston, with a three-minutes stop at Willesden, did reach Bletchley, 41¼ miles, in 46½ minutes from the latter station, and after a fresh start, ran to Northampton, 19 miles, in 21½ minutes with a bad slack over the crossing at Roadé Junction. Thus the running time from Willesden to Northampton, 60¼ miles, with a midway stop and a bad slack, was only 68 minutes. This, too, was an exceptional feat in those days, although the train had not more than ten coaches.

Yet another run of what I may term the earlier "Precedent" period was that of the most widely famous member of the fraternity, "Charles Dickens," No. 955, which is renowned as having run more miles since her birth, in 1882, than any locomotive that the world has ever seen. Up to Jan. 1st, 1899, "Charles Dickens" had travelled the amazing distance of 1,718,564 miles! Her daily duty has been to run from Manchester to London by the morning express and back again by the corresponding afternoon train. This was a much harder task, so far as speed goes, in 1884 than now, as the up train was then allowed only 4¼ hours for its journey,

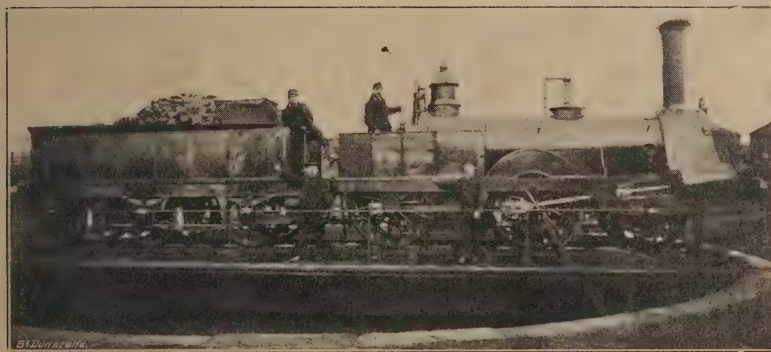
while for the run from Blisworth to Willesden—start to stop—the allowance was but 65 minutes, the distance being $58\frac{1}{4}$ miles, an average speed of nearly 53 miles an hour being thus demanded. The trains, however, were much lighter in those days, and “Charles Dickens” accomplished the task with ease. Indeed, on the first occasion of my travelling by that train, the journey of $58\frac{1}{4}$ miles was performed in 62 minutes, or 3 minutes under time, but with a train of only seven vehicles.

In those days the timing over the Crewe-Carlisle length was very slow as compared with what has existed during

ease and safety, in the way of rapid travelling.

But when it was discovered that the 51 miles from Crewe to Preston could be run in 50 min., and the $90\frac{1}{4}$ from Preston to Carlisle in 90 min., notwithstanding the Shap Bank, then the clever little “Precedents” had a chance of displaying their true powers. With a timing at the rate of 53 miles an hour from Carlisle to Preston, and 52·7 in the opposite direction, plenty of opportunities for fast running were afforded and were duly taken advantage of. Thus, when after another absence of several years I again returned to England at the beginning of 1893, I

found most remarkable progress in respect of swift locomotion—to the north of London, at any rate. Further, the “Precedents” had mostly been given new boilers with 150 or 160 lbs. of steam—I usually found the latter point reached before blow-



EARLIEST TYPE CREWE COUPLED ENGINE, WITH FIVE-FOOT DRIVING-WHEELS

the last ten years. The quickest time between Crewe and Preston (51 miles) was 63 min., and between Preston and Carlisle ($90\frac{1}{4}$ miles) 2 h. 12 min. So there was not much scope for good work on that interesting section of the London and North Western, except occasionally when lost time had to be made up. In one instance, with the up Scottish express, “Commodore,” No. 478, covered the $37\frac{1}{2}$ miles from Shap Summit to Lancaster (passing) in $35\frac{3}{4}$ min., attaining 74 miles an hour down the bank; the load was 13 coaches. This was smart work, but I found it rare in 1884, in what we now look on as the benighted and laggard days before the “Race to Edinburgh” had shown us what could be done with

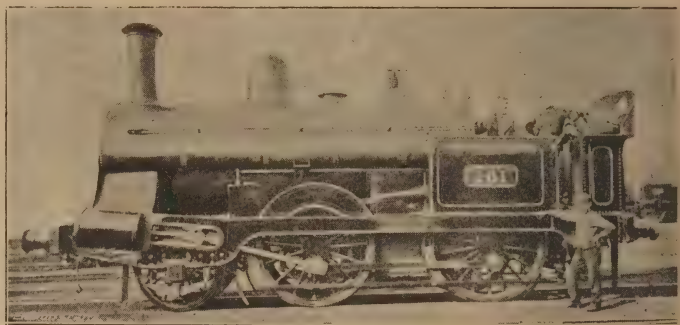
ing-off occurred, and most of the Ramsbottom 6 ft. 6 in. coupled had been converted into “Precedents,” while the 5 ft. 6 in. “Precursors” were undergoing conversion into tank-engines, and the 6 ft. “Samsons” into express locomotives. I found the “Precedents” taking their turn on the best expresses and keeping time at very high-booked speeds with heavy loads, while under favourable conditions they gave me instances of maximum velocities which were not surpassed by any of the “crack” single-wheelers of other lines, and indeed were very rarely equalled. In fact, in one of my earliest journeys over the Crewe-Carlisle line after my last return to England, I obtained figures which long constituted a

record in my own experience. Two or three trips had been marred by signal checks or relaying slacks, but even so there were indications of the enhanced smartness. Twice, with the down train which leaves Euston at 10 a.m., I noted a speed of 80 miles an hour between Penrith and Carlisle, and the distance of $17\frac{3}{4}$ miles from passing Penrith to the stop at Carlisle was done in $16\frac{1}{4}$ and $16\frac{1}{2}$ min. respectively. But one of the up journeys proved in several respects most remarkable. It is true that two engines were employed from Carlisle to Crewe, but the load was fully 230 tons, exclusive of the engines and tenders.

Starting from Carlisle two minutes late, with two engines on, both of "Precedent" class, we had done some good uphill work when we experienced our first stroke of ill-luck in a signal stop at Penrith, 22 min. 53 sec. for the $17\frac{3}{4}$ miles from start to stop, nearly all up a steep grade. Getting away again, we reached Shap Summit, 14 miles, mostly 1 in 125 up, in $17\frac{3}{4}$ min., and then made a phenomenal descent of the Shap incline, the first $4\frac{1}{2}$ miles of which are at 1 in 75, the last two miles before Tebay being run in 42 sec. each, or at the rate of 85.7 miles an hour. The next 6 miles of level and slight rise to Grayrigg were got over in $5\frac{3}{4}$ min. and then came another swift descent; the speed down the Grayrigg bank—which averages 1 in 130 for 15 miles—steadily increasing until 82 miles an hour was touched as Milnthorpe was neared. But then came another mishap. The Milnthorpe home signal said "Stop!" And this we had to do, much to my disgust, as there was a good chance of the Shap maximum being again reached before we lost the help of the long falling gradient.

However, there was no help for it; but when we got away again we had no further check before we stopped at Preston. The time for the $37\frac{3}{4}$ miles from Penrith to Milnthorpe, start to stop, including the 14 miles ascent of Shap, was 38 min. 33 sec.; and that from the Milnthorpe start to the Preston stop, $34\frac{1}{2}$ miles, including the climb from Lancaster to Galgate was 34 min. 56 sec.

An analysis of this trip gives some very remarkable figures. The entire journey of 90 miles 10 chains from Carlisle to Preston occupied exactly 98 min., to a second. But out of this total we were standing 1 min. 38 sec. at Penrith and Milnthorpe respectively. Thus the



EARLY TYPE CREWE COUPLED ENGINE, WITH 5 FT. DRIVING-WHEELS, REBUILT AS SADDLE-TANK LOCOMOTIVE

actual time in motion was only 96 min. 22 sec. This allows nothing for the loss by two stops. If this loss, carefully ascertained, be deducted, it leaves the net time only $90\frac{1}{2}$ min., a sufficiently remarkable achievement when the gradients are taken into consideration. But our feats were not yet at an end. Leaving Preston we ran to Crewe, 51 miles, in 56 min. 2 sec, actual travelling time, *with two intermediate stops and two bad slacks* by signals! Deducting these losses, the net time from Preston to Crewe was $49\frac{1}{2}$ min., and from Carlisle to Crewe, $141\frac{1}{4}$ miles, 140 min. Comparatively few smarter performances have ever come under my notice.

From Crewe we had only one engine

of the same type, "Cromwell," No. 1531, but our load was reduced to about 210 tons, still a highly respectable weight

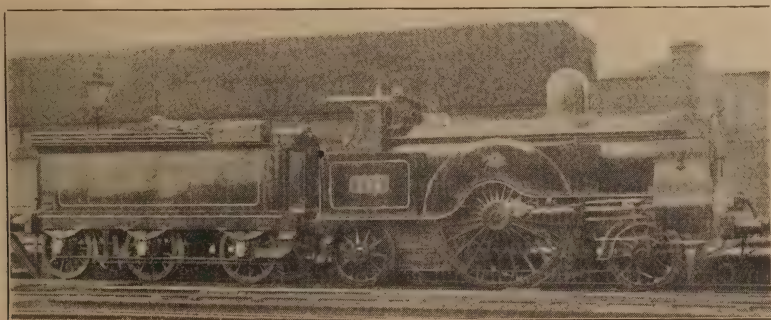
running time from Crewe, $75\frac{1}{2}$ miles, being thus 83 min. 44 sec., and the net time 81 min. The following length of 77 miles



L. & N.W. GOODS LOCOMOTIVE OF THE TYPE TEMPORARILY TURNED INTO EXPRESS-ENGINES
BY TAKING SIDE-RODS OFF LEADING WHEELS

to be hauled by one engine at such speed. Indeed from the technical viewpoint of locomotive work, the Crewe-London length was even more praiseworthy than the other. After climbing the $10\frac{1}{2}$ miles of 1 in 177, 1 in 250, and 1 in 330, to the Whitmore summit in 15 min. 29 sec., and passing Stafford, $24\frac{1}{2}$ miles, in 28 min. 35 sec. from the start, we were making good progress when another adverse signal brought us to a dead stand at Elmshurst Crossing, 43 min. 10 sec. from Crewe, the distance being $39\frac{1}{4}$ miles. After a stay of 3 min. 4 secs. we obtained

from Rugby to the Willesden stop was done in exactly $83\frac{1}{2}$ min., the engine having eased down after Tring, as the train, notwithstanding all these delays, was before its time. Euston was reached finally at 6.42, or three minutes early, in spite of a start from Carlisle two minutes late, five extra stops—amounting to $6\frac{1}{2}$ min.—and $9\frac{1}{2}$ min. stay over time at the regular stopping places, while the larger half of the journey was run with only one engine, and the loss of time through signal delays, exclusive of the actual dead stand, was fully 17 min.



[Photo]

[F. Moore

"PROBLEM," THE PIONEER OF MR. RAMSBOTTOM'S 7 FT. 6 IN. SINGLE-WHEELERS,
BUILT IN 1859, AND STILL RUNNING EXPRESS TRAINS

"road clear" again, and ran the remaining $36\frac{1}{4}$ miles to the regular stop at Rugby in 40 min. 34 sec.; the actual

On another occasion two of these engines, "Chillington," No. 2188, and "Graves," No. 1141, ran with 14 coaches from Preston

to Crewe in 53 min. 4 sec., and "Marathon," No. 517, unaided, took a 15-coach train from Bletchley to Willesden, $41\frac{1}{4}$ miles, in 44 min. 23 sec.; while "Snowdon," No. 2191, with 15 coaches, ran from Crewe to Rugby in 87 min., and Rugby-Willesden in 87 min., the load in each of the two latter cases being fully 220 tons. Also "Buffalo," No. 2181, took 14 coaches from Rugby to Crewe, $75\frac{1}{2}$ miles, in 83 min. 58 sec., with an intermediate slack; and "Fairbairn," No. 870, ran the Dining-car train of 13 coaches from Nuneaton to Willesden, $91\frac{1}{2}$ miles, in 103 min. 10 sec., easing down after Tring to avoid a too-early arrival.

I now come to some more recent achievements which approach the marvellous, when the size and nominal power of the engines are considered. As an illustration of fast work with a light load on a course largely uphill, I may quote the performance of "Mercury," No. 749, which, with 112 tons, ran the first $58\frac{1}{2}$ miles from Euston in 60 minutes, ascending the $14\frac{1}{4}$ miles, averaging 1 in 330, from Watford to Tring in 14 min. 28 sec., passing Tring Summit, $31\frac{3}{4}$ miles, in 35 min. 17 sec. from the start; Bletchley, $46\frac{3}{4}$ miles, in 48 min. 58 sec., easing down at Roade, but, nevertheless, passing Rugby, $82\frac{1}{2}$ miles, in $88\frac{1}{4}$ minutes, Tamworth, 110 miles, in 1 hr. 59 min. 59 sec., and reaching Crewe, 158 miles, without a stop, in 2 hr. 57 min. 35 sec. The same engine on the Irish mail did equally good work in hauling a huge load of 245 tons from Euston to Rugby in $101\frac{1}{2}$ minutes, and "Lazonby," No. 512, in taking an even heavier one of 264 tons from Rugby to Willesden in 92 min.

Just a week after the run of "Mercury" from Euston to Crewe, which I described just now, "Eamont," No. 394, accomplished one even more meritorious, the load being 195 tons; in spite of which the speed never fell below 53 miles an hour up the bank from Watford to Tring, that station being passed in $37\frac{1}{2}$ minutes from Euston; Bletchley in $51\frac{1}{2}$ minutes; Rugby in 90 min. 11 sec.; Tamworth, 1 hr. 59 min. 15 sec.; Stafford, 2 hr. 25 min. 4 sec.; while Crewe was reached with that substantial load in 2 hr. 55 min. 36 sec. Clearly this was a very noteworthy piece of work.

More recently "Caractacus," No. 477, with 170 tons, did the journey, London-



Photo]

[F. Moore

"ZENO," ONE OF MR. RAMSBOTTOM'S SMALL 6 FT. COUPLED, REBUILT BY MR. WEBB AS A NEW EXPRESS ENGINE

Crewe, in 2 hr. 54 min. 24 sec., passing Tring in 37 min. 14 sec.; Bletchley, 50 min. 39 sec.; Rugby, 94 min. 8 sec.; Tamworth, 1 hr. 59 min. 28 sec.; Stafford, 2 hr. 24 min. 24 sec.

With loads of 112 to 120 tons "Hardwicke," No. 790, and "Queen," No. 1213, each passed Wigan from Crewe, 36 miles, in 36 minutes, as timed by myself. "Dagmar," No. 1668, took a train weighing 187 tons from Crewe to Rugby, start to stop, in 80 min. 30 sec. for the $75\frac{1}{2}$ miles, in spite of 1 min. 50 sec. being lost by a bad relaying slack, which left the net time 78 min. 40 sec. The final length of 51 miles from Stafford to the stop at Rugby was covered in 49 min. 36 sec. The same journey was continued by "Disraeli," No. 867, from Rugby to Willesden in 82 min. 9 sec.

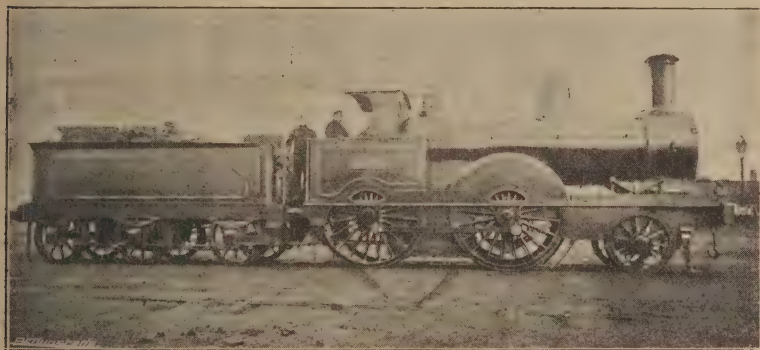
I now come to three cases, which in some respects stand alone. They comprise one of the best start-to-stop runs I have ever had on a British line, and two instances of the highest speed I have ever recorded, with the single exception of my 90 miles an hour record for three quarters of a mile with a Midland single-wheeler.

Starting from Penrith 50 minutes late, a 6ft. 6in. coupled and a "rebuilt" 6ft. coupled, actually made up 16½ minutes on the run to Preston, covering the 72½ miles in 69 min. 30 sec. from start to stop, with a load of 194 tons. The heavy ascent of 14 miles to Shap Summit was mounted in 17½ minutes, and then the remaining dis-

in 28 min. 12 sec., with slacks past Eamont Junction and Penrith curve. From the last-named station the run of nearly 18 miles to the Carlisle stop was done in 15 min. 10 sec., two miles being run in 41 seconds each, or at the rate of 87.9 miles an hour, an absolute record in all my experience up to that date.

Strangely enough that record was broken on the very next day, and by one of the same pair of engines going in the opposite direction. The load was 211 tons, and a pilot (of the "Samson" class) was taken from Carlisle to Shap Summit, the 31½ miles, mostly up—I in 125 and 1 in 132—being climbed in 37 min.

36 sec. from start to stop. Dropping the pilot the train engine then ran the next 31½ miles to a signal slack at Carnforth in 28 min. 26 sec., and attained a maximum speed of 88.2 miles an hour, several successive miles being done in 10.2



"SIR HARDMAN EARLE," A 6 FT. 6 IN. COUPLED ENGINE OF "PRECEDENT" CLASS, WHICH RAN 20 COACHES FROM RUGBY TO WILLESDEN IN 93 MINS.

tance of 58½ miles to Preston was run in 52 minutes to the dead stop. Of this total one length of 35 miles was done in 29 min. 53 sec., or at the average rate of 70.3 miles an hour, and maxima of 81.8 and 85.7 miles an hour were attained at two different points. Such work is manifestly most exceptional.

In the other two cases still greater speeds were reached, although, owing to checks, the total journeys did not show such high averages. The 11.50 p.m. from Euston, which weighed 304 tons, had been delayed by signal stops, and making up time subsequently, was run by two 6ft. 6in. coupled engines of the "Precedent" class, from Shap Summit (passing at 15 miles an hour) to the stop at Carlisle, 31½ miles,

seconds each. That, with the one exception noted above, is the highest speed which I have ever recorded, or of which I have any authentic record. It may interest those who regard such velocities as the peculiar prerogative of single-wheelers and large-wheeled engines, to note that these rates of 88.2 and 87.9 respectively were attained by coupled engines with wheels only 6 ft. 6 in. in diameter.

But here I must stop for the present although my list is by no means exhausted. I think it will be admitted that I have justified my claim to regard these 6ft. 6in. coupled "Precedents," of Mr. Webb's design and construction, as emphatically "wonderful little engines."

PERTINENT PARAGRAPHS

"Railways have rendered more services, and have received less gratitude, than any other institution in the country."—JOHN BRIGHT.



AFTER many threatenings the railway companies now know the worst that can befall them as a result of the holiday jaunt of Mr. Hopwood, the Railway Secretary of the Board of Trade, in the United States, last year. The Bill introduced by the Government provided that:—

"No Railway Company, after the time named (five years), would be allowed to draw any truck, whether belonging to private owners or not, which had not an automatic coupling. The Bill further provided that after two years the Board of Trade should require steam brakes to be applied to all engines. It was also provided that hand brakes should be fitted to both sides of the trucks, as and by that means they rendered it unnecessary for a man to go from one side of the truck to the other, which was often attended with serious danger. The Bill made it necessary, after the expiry of two years, that all trucks should be provided with labels on both sides. The Bill also made provision for communication between passengers and the drivers and guards. At present the law did not apply unless the train proceeded a distance of over 20 miles without stopping. The Bill made the law applicable to all trains, however short their run. At the end of two years communications approved by the Board of Trade would be applied to all trains. The only other provision in the Bill was a financial one, making it easier for the Railway Companies to incur this expenditure."

* * *

Mr. Ritchie, the President of the Board of Trade, in introducing the Bill, said:—

"He was satisfied that after the Bill became law the Railway Companies would find, as had been found in the United States, that there was not only a large reduction of fatal and other accidents, but that the convenience of moving about trucks would be so great that they would not be willing to revert to the old system."

He was, however, very wide of the mark, as enquiries show that in the United States, with automatic couplers in general use, accidents to shunters are much more

prevalent than in this country, whilst another form of very serious (generally fatal) accident has been introduced by the use of automatic couplers—we refer to "falling from trains and engines"—561 of which accidents happened in the United States recently.

Accidents in falling from trains and engines are attributable to the American method of setting brakes, and upon the two sets of figures 38 per cent. of the total number of fatal accidents in America resulted while coupling cars or setting brakes. But if reference is made to the English Board of Trade Returns for the same year (1890) it will be seen that only 16 fatal accidents occurred in the coupling or uncoupling of vehicles, and only eight "whilst breaking, spragging, or chocking wheels"; while, as against 10,190 cases of injury in the American Returns under the two heads already named, only 559 instances were recorded in the English Board of Trade Returns.

There is no basis of real comparison with the number of accidents from the same cause in the United Kingdom and the United States. Indeed, if such a comparison were made, it would seem to be rather in favour of the system which it is proposed to supersede. In 1893 the number of fatal accidents to railway servants in Great Britain was 460, of which 11 were in coupling and uncoupling. In 1897 the total rose to 501, of which 19 were in coupling and uncoupling. The corresponding returns for the United States were:—2,727 and 433 in 1893, and 1,693 and 214 in 1897. It will be seen, therefore, that whereas in Great Britain the percentage of fatal accidents in coupling and uncoupling was 3·8 in 1897, the percentage in the United States was not less

than 12.6. In other words, if our percentage had been as high as that of American railroads we should have had 63 fatal accidents from coupling and uncoupling, instead of only 19.

* * *

There is another factor that ought to be taken into the calculation, if any comparison is to be made. The mileage of the railways of the United States is approximately 170,000 miles, while that of British railways is about 22,000, or one-eighth the mileage of American railways. On this basis, if accidents from coupling had been as infrequent on American railroads as they are on British railways, the number in 1897 would have been 152 instead of 214. Again, it must not be forgotten that the number of trains per mile on British railways is at least double that on American railroads. If this is taken into account on the same percentage, the accidents in the United States would be no fewer than 428. The inference fairly to be drawn from these comparisons, on which Mr. Hopwood places much reliance, is that even with automatic couplings American railway men run more risks than British railway servants who have not these improved appliances.

* * *

The Railway Association has sent a deputation to the United States to inquire into the working of automatic couplers, and the locomotive engineers on this committee will doubtless take advantage of their visit to see the American goods engines that are being constructed in the United States for the Midland Railway. Such is the irony of fate, that the competitors of the Midland Railway will become acquainted with the American engines before the Locomotive Superintendent responsible for introducing them into England has seen them.

* * *

If the Bill for making the use of automatic couplers compulsory becomes law, the Midland Railway will be hit very hard. Some years ago this railway bought up all the waggons of private owners on its system, and it has now an immense number of these vehicles—according to the Railway Year Book for 1899, 117,730 against 67,068 owned by the London and

North Western, and 54,611 owned by the Great Western. At the time the Midland Directors prided themselves on their perspicaciousness, although competent critics pointed out the dangers of such a proceeding, which may be fulfilled in the near future at an immense expense to Midland shareholders.

* * *

The Government Bill proposes to allow railways to obtain the enormous sums of money necessary to equip their rolling stock by means of debentures, but the present debenture and preference shareholders should have a voice in such a matter. As the Bill is notoriously introduced for the (alleged) better protection of the life and limbs of shunters, it is evident that the men engaged in this occupation consider it a dangerous employment, and consequently receive wages proportionate to the risks they run in fulfilling their duties. This being so, it would only be fair to the railways that the shunters and others who expect to benefit from the introduction of the new appliances should be willing to have their wages reduced by the amount of interest the Companies will have to pay annually on the additional capital. The Government also ought not to tax the interest on these debentures, although of course the shareholders should be charged the usual Income Tax, which should go to the credit side of the railway companies' balance sheets.

* * *

A correspondent of the *Standard* writing on the subject of Automatic Couplers introduces the two systems of automatic brakes, and alludes—

“To the fact that in the case of the Auto-Vacuum (or English brake), 60,947,000 train miles were run by certain named railways with only 145 instances of delay resulting from failure of the brake in any circumstances; but in the case of the American invention (Westinghouse) used on certain other English railways there were 196 instances of delay, owing to failure, for a train mileage of 30,020,000 miles only, practically showing that the English invention works with about one-third only the number of failures as compared with the American invention. The writer of the Memorandum (Mr. Hopwood) must have considerable temerity in alluding to this subject, regard being given to the fact that the Board of Trade are not without grave responsibility in reference to the absence of uniformity. It will be remembered by many English railway men that during the time that the English Companies were experimenting with various descriptions of

brakes, including the Automatic Vacuum, which is proved to be so much more suited to English working than the other appliance named in the newspaper which is quoted, the then Chief Inspecting Officer of Railways under the Board of Trade commercially took up the advocacy of the American appliance in question in the United Kingdom, and relinquishing his Government appointment, used the information and knowledge that he had there obtained to induce English Companies to accept this American appliance, as being, to use his own words, 'the best that had been or could be devised.' I wonder what the Board of Trade now desire the Railways to do? Are the 60,000,000 of train mileage worked on the English system with 145 delays to be brought under the American system, which shows 196 delays on 30,000,000 of miles? If not, and if it is the desire to compel those Railways which adopted the urgent recommendation of the ex-Officer of the Board of Trade to give up the best appliance 'that had been or could be devised,' in that case it may be asked in what way the Board of Trade intend to give just and due compensation to these Railways?"

* * *

Mr. W. S. Laycock, whose business at Sheffield is known all over the world in connection with railway apparatus and specialities, has given an interviewer his views on the "Couplings" Question. Mr. Laycock believes that our railways are ready to consider improvements in the matter of couplings for passenger carriages, and points out that the Great Central has already adopted the Gould Coupler for its new trains.

* * *

The second reading of the Bill for the joint working of the South Eastern and the London, Chatham and Dover Railways was carried by the enormous majority of 206, only 82 voting against the measure, which has been referred to a Select Committee. It is noteworthy that the County Councils of Kent, Surrey, and Sussex have not petitioned against the Bill, nor has such a course been taken by any urban district authority or any corporation, save and except Canterbury, which has lodged a petition, not against the preamble of the Bill, but with a view of obtaining protective clauses, such as the Board of Trade has lately been engaged in settling. This was also the object of the intervention of the railway traders' organization. On the other hand, petitions in favour of the Bill were forthcoming from such representative centres as Hastings, Tunbridge Wells, Maidstone, and Ashford. The objection of that meddlesome

body of faddists, the London County Council, which related principally to the provision of workmen's trains, is understood to have been substantially met by the undertaking into which the promoters of the Bill have entered. With regard to the grievances from which Kentish traders are stated to be suffering, it is interesting to note that since the Act of 1888 was passed, not a single application against the South Eastern Company in respect of any alleged undue preference to foreign produce has been lodged before the Railway Commissioners.

* * *

A financial contemporary very neatly sums up the absurd opposition to the Bill that a halfpenny "yellow" paper run on the usual blatant American lines, has been trying to stir up against the working union. It says:—

"The agitation against the measure has been obviously bogus from the very beginning. The newspaper in question, under pretence of serving the public, has been in reality merely engineering a boom in the South-Eastern counties. The conductors of the journal have in the most grotesque fashion distorted facts to suit that boom. They have misreported at least one prominent Kent public man, and have refused him the right to correct their representative's misstatements in their columns. They have sent reporters into the villages and hamlets of the South-Eastern counties to stir up local grievances and to work up agitations among unimportant local bodies in the more important towns. Day by day they have printed in the columns of their paper an enormous amount of sensational twaddle, under the delusion, apparently, that they were advancing their cause. They have formulated the most ridiculous demands on behalf of persons well able to look after their own interests. It is a notorious fact that no railway company succeeds in pleasing all the public it is constructed to serve. There are always private individuals, tenth-rate associations of traders, and second-hand corporations who are disgusted with the train service. They expect their trains to be constructed upon the trunk line models, and to run between the metropolis and their fifth-rate town at express speed. They expect freight rates which would not pay for oiling the engine, and they want their half-hundredweight of potatoes or ten baskets of strawberries run up to town whenever it suits their convenience. From such people as these it is always possible to obtain views, and among them it is always easy to organise opposition to any scheme which is likely to result in the greatest good to the greatest number."

* * *

It is a matter of undoubted fact that the South Eastern and London, Chatham and Dover Railways are only carrying out the strict views of Parliament enunciated

when the southern railways were sanctioned. In Sekon's "History of the South Eastern Railway," we read—

"In 1836 the Speaker of the House of Commons said: 'No second outlet (for a railway) would be allowed to the South.' In 1836 also, a proposal had again been brought forward to extend the Greenwich line through Kent to Dover, but the Committee of the Commons stated that such a line would be suitable as a route to Ramsgate, but not to Dover. This line has since been constructed to Chatham, and is known as the North Kent line."

* * *

In our issue of February last we referred to a new arrangement on the French railways relative to the conveyance of passengers' luggage. Modifications have also been introduced into the cloak-room arrangements, and there is a good deal of grumbling going on concerning the same, which are of interest to English travellers. Hitherto the charge of a penny per package per day prevailed. A new tariff has, however, been introduced which allows the company to charge a penny, or ten centimes, for the first day, threepence for the second day, and to double the amount for each succeeding day. Thus a handbag left in a French cloak-room for four days would cost the owner one franc and 60 centimes to obtain its release.

The reasons for these modifications are not without their interest, and arise principally from the abuse of the cloak-rooms in some of the large towns of France. Certain people had discovered that the charge of a penny a day for housing their bicycles, perambulators, or, in fact, any cumbersome articles, was not exorbitant, and consequently profited by the accommodation offered, to the detriment of the Railway Company, who have now been allowed by the Government to introduce a remedy by increasing their charges.

* * *

Some writers on railway matters are fond of suggesting the adoption of American types of rolling stock by British Railways, but from a statement by Mr. J. Price, the Vice-President of the Grand Trunk Railway, a gentleman thoroughly *au fait* with every detail of railway management, both here and in America, it is evident that the rolling stock in use on the other side of the Atlantic could not be advantageously

used here. After debating some experiments, he concludes:—

"These data show the large capacity of the American cars to be advantageous, but some facts had to be considered which would prove that cars of American capacity could not be used on English roads. On this phase of the subject it was explained that American cars are 12 tons in weight, with a capacity of 30 tons of coal, but the cars capable of use for such tonnage have to be very much wider than the English "waggons." All of the American cars are fixed on trucks, and the bodies of the cars partly overhang the permanent way, and to introduce them into the English system all the bridges and tunnels would have to be widened, which is too serious a matter to contemplate. These facts dispose of the possibility of adopting the American system on English railways."

* * *

In our issue of August, 1897, pages 187 and 188, we alluded to some absurd pamphlets sent to us for review by a Chiswick chemist. He has again favoured us with some more of his effusions, bearing such grotesque titles as "A Letter to a London Policeman" (addressed to Sir Edward Bradford, the Chief Commissioner of Police). "Special Fare System, Extortions, Frauds and Plunder for Dividend. How the Offenders elude Justice." "Railway Thieves," and other "penny dreadful" titles. So far as we can discover, this chemist, who is apparently really clever in his own business, some years ago brought an action against the London and South-Western Railway about a trivial matter, and naturally lost. Since then he has devoted his time to printing every silly thing it is possible to think of concerning railways. It apparently pleases the chemist and certainly does not hurt the railways—or any body or thing else.

* * *

Last month we published an article describing the phenomenal progress of the West Australian Railways, and we have now been favoured by the Agent-General with a copy of the penny pocket time-table issued to the public in West Australia. The brochure contains several features worthy of imitation by British railways, among which we may mention the height above sea level of each station, its distance from the terminus of the branch, and the platform at which the various trains will arrive or depart at the principal stations. In addition to the bye-laws, there is a page of notices in the book, with this introduc-

tion: "The observance of the following regulations in brief would avoid much unpleasantness in railway travelling, and greatly tend to the comfort of passengers." Two of these are well worthy of reproduction here.

"6. Never hesitate to allow a ticket collector to examine your ticket. Remember that obstruction to collectors, who, in examining tickets, are only carrying out instructions, must result in delay and inconvenience to other passengers."

"9. Civility on the part of railway travellers to porters and others, who have frequently unpleasant duties to perform, will, as a rule, command civility in return. Conduct to the contrary on the part of railway servants should at once be reported to the nearest stationmaster."

A calendar is another useful feature of this time-table.

* * *

Nearly half a century ago, railway directors or managers appear, in one case at least, to have adopted rather questionable measures to increase their proportion of mileage receipts. We are led to this conclusion by a practice obtaining on the Blackwall Railway, over which line the North London Railway at the time in question conveyed its City passengers to Fenchurch Street Station. The fare from Stepney (on the Blackwall Railway) to both Bow and Hackney (on the North London Railway) was 6*d.* The Blackwall Railway received 5*d.*, and the North London 1*d.* out of the 6*d.* paid for a ticket to Bow, but a ticket to Hackney from Stepney gave 1*d.* to the Blackwall Railway and 5*d.* to the North London Railway. It was the practice of the booking clerks at Stepney (a Blackwall Railway station) to issue tickets to Bow when Hackney tickets were applied for; by this means the Black-

wall Company pocketed 5*d.* of the fare, and the North London Railway only obtained 1*d.*, although the latter was entitled to the 5*d.* If passengers demurred at receiving a Bow ticket when they wished to travel to Hackney, they were told that the fare was the same, and that the ticket was available. This explanation usually satisfied the travellers, until one gentleman, a shareholder of the North London Railway, who was more curious than the rest, inquired into the proceeding, and not being convinced by the explanations of the booking clerk and ticket collectors, brought the practice to notice of the directors of the North London Railway, with the result that the system was abandoned.

* * *

It is interesting to learn that the Ashbury Railway Carriage and Iron Company, Ltd., have secured the order for the carriages for the Central London Electric Railway.

There was much competition from the American builders, but the railway company have decided to entrust their large order for carriages to the Ashbury Company.

These carriages are much in advance of anything that has been put upon the electrical lines up to the present.

Mr. Charlton, the manager of the Ashbury Company, is to be congratulated upon his success in the matter. The electric railways that excuse themselves for ordering their rolling stock in America on the grounds that English firms cannot supply them, will no longer be able to do so.

WHAT THE RAILWAYS ARE DOING

CAMBRIAN.



R. Denniss has made excellent arrangements for the benefit of Easter tourists, and doubtless the Cambrian traffic will greatly benefit thereby.

Mr. Herbert E. Jones, District Locomotive Superintendent of the Midland Railway at Manchester, has been appointed Locomotive Superintendent of the Cambrian Railways.

FURNESS.

There is little doubt that the arrangements for the coming tourist season will, under Mr. Aslett's management, be on even a more liberal scale than the excellent ones obtaining last year. Furness shareholders will of course reap the benefit of this policy.

GREAT CENTRAL.

After the festivities of Thursday, 9th March, the Marylebone Terminus of the Great Central Railway settled down to ordinary business, the public service of trains being inaugurated on Wednesday March 15th.

Only four passengers travelled by the first train that left Marylebone Railway Station—the first passenger train on the new line. Having regard to the fact that the hour was 5.15 in the morning, and that no effort was made by the Company to acquaint the public with the service, the small number is not surprising. At 9.15 fourteen passengers presented themselves, and at a quarter past one o'clock the number rose to thirty-four. The 5.15 evening express is a dining-car train, and fifteen first-class passengers applied for reserved seats. These results are regarded as eminently satisfactory. Time was punctually kept, and drivers report favourably on the condition of the new permanent way. The service was opened without ceremony, though the engines were decorated with flags, and Mr. Harry Pollitt, Locomotive Superintendent, and Mr. Monckton, the Stationmaster, were present to witness the departure of the first train. Throughout the day the station, which is still in an

unfinished state, was invaded by crowds of visitors, who watched with interest the arrival of four special trains from Nottingham, carrying between two and three thousand passengers, among whom were the Mayor and the Sheriffs.

Some surprise was manifested at the construction of the time table, but the following notice will explain to the uninitiated the reason for the slowness of the trains.

"The Great Central Company beg to give notice, in connection with the opening of their London Extension Line, that they will adopt the course usual in such circumstances, and run the through trains at moderate speeds. The service of trains, as advertised, will only remain in force from the opening (15 March) until 30th June. On the 1st July an accelerated and improved service of trains to and from London will be run, of which due notice will be given."

The new time-table book is worthy of special notice, several new features being introduced, indeed, a glance through the 166 pages of this publication will give some idea of the thousand and one details that have to be thought out and arranged before a new trunk line can be opened. The arrangements, as set forth in the time tables, so far as London is concerned, are quite equal to those of any other railway.

The Great Central Railway is to be congratulated upon its new crest and motto, the latter is "Forward"—may the management live up to it. The coat-of-arms has at the top a front view of a modern Great Central Railway locomotive, which clearly demonstrates the great advance in the science of locomotive construction, when compared with the engines depicted on the coat of arms of the London and South Western and London and North Western Railways, adopted many decades back.

GREAT EASTERN.

We regret to learn that a sudden illness prevented Mr. Holden, the successful Locomotive Superintendent of this line, proceeding to America as one of the committee sent by the English Railways to enquire and report on the use of Automatic Couplers in the United States.

Extensive and liberal arrangements are announced for the Easter holidays—cheap

excursions to all parts of the Great Eastern system and Scotland, in addition to extension of time for return tickets; whilst, for the accommodation of persons detained at business until late in the evening of Saturday, special midnight trains will leave Liverpool Street at 12.0 night for Norwich, *via* Cambridge, and at 12.30 night for Yarmouth and Lowestoft, *via* Ipswich, calling at the principal intermediate stations.

GREAT NORTH OF SCOTLAND.

Mr. Moffatt, the enterprising General Manager, has secured another success.

The palatial hotel which he has caused to be erected by the Great North of Scotland Railway Company at Cruden Bay was formerly opened on the 1st March. The external appearance of the hotel is exceedingly handsome, and internally it has been fitted up in the most luxurious style.

Additional fast up and down trains are now run to Aberdeen, Cruden Bay, and Boddam.

GREAT WESTERN.

The following rolling stock, formerly the property of the North Pembrokeshire and Fishguard Railway, has now been added to the Great Western rolling stock:—Three tank engines, two composites and six third class carriages, six open goods waggons, nine cattle trucks, four timber trucks, and one guard's van. Readers will be interested to learn that good progress continues to be made with the construction of the South Wales and Bristol Direct and the Stert and Westbury Lines; and with the various widenings, and new stations, and other works, whilst the Avonmouth and East Usk Railways and the extension of the Pennar Branch are nearly completed.

A contract is about to be let for the construction of the Rhos Lines near Wrexham, authorised by the Company's (Denbighshire Railways) Act, 1896; and tenders will be invited at an early date for the construction of the Truro and Newquay Line, of the portion of the Acton and Wycombe Line between Acton and Gerrard's Cross, including the connecting Loop with the Main Line at Castle Hill, and of certain of the Lines at Bristol authorised by the Company's (Bristol Lines) Act, 1897.

LANCASHIRE AND YORKSHIRE.

This Company is seeking Parliamentary powers for the construction of a Railway from Manchester through Blackley to Middleton, and a connecting Line at Middleton Junction. The amount of Capital to be authorised in this Bill is £720,000, with the usual borrowing powers. Also for the widening of the existing Railway from Rainford Junction to Orrell, and at Pemberton, and, in conjunction with the London and North Western Railway Company, the construction of a flying junction at Kirkham, on the Preston and Wyre Railway. These works are necessary for the satisfactory working of the traffic. The Bill also contains powers for the acquisition of lands at various places for station extensions and other improvements. The amount of capital to be authorised by this Bill is £378,000, with the usual borrowing powers.

The Lancashire and Yorkshire's duplicate stock comprises 62 engines, 52 tenders, 24 composites, and 324 third class carriages, 52 luggage vans, 20 horse boxes, and 10 carriage trucks.

LONDON AND NORTH WESTERN.

The duplicate rolling stock comprises 495 engines, 595 1st class and composite carriages, 71 second class, and 614 third class carriages, 22 horse boxes, 115 carriage trucks, and 325 break and parcels' vans.

In addition to the profit earned in working its own railways, the London and North Western received the following sums from other lines in which it is interested:—

By Dividends on Shares—		£	s.	d.
North London.....to 30th June last		49,827	7	6
Manchester & South Junction	" "	16,321	18	8
Shropshire Union	" "	5,158	13	3
West London Extension	" "	3,658	2	8
Cockermouth and Penrith	" "	593	15	0
Great Southern and Western	" "	1,398	1	2
Callander and Oban to 31st July last		1,125	0	0
By Great Western Railway. Moiety of Shrewsbury and Welshpool and Vale of Towy Dividends		3,750	0	0
By Furness Railway. Moiety of Whitehaven, Cleator and Egremont Dividend		11,487	10	0
		93,320	8	3

LONDON AND SOUTH WESTERN.

We regret to announce the death of Mr. G. T. White, the Superintendent of the Line, which took place early on the Friday morning, March 17th. Mr. White entered the service of the Company as a lad clerk in 1867, and worked his way upwards through different positions until he was appointed, in July 1876, Assistant-Superintendent of the line in the West of England. On the transference of Mr. John Tyler, the then Superintendent of the division, to the position of the Superintendent of the whole of the line, in 1882, Mr. White succeeded to the post which his chief had vacated. His headquarters were then at Exeter, and his division covered the whole of the railway west of Salisbury. He was promoted to Waterloo in July 1893.

On Monday, March 27th, the New Line to Padstow, which has been cut by the North Cornwall Railway Company, and will be worked by the London and South Western Railway Company, was opened for public traffic.

The Railway, which is almost level, runs along the Southern bank of the River Camel and commands a magnificent view throughout the entire journey of $5\frac{1}{2}$ miles.

There are several cuttings of very hard stone known as "Elval Dykes," many of the stones taken from the cuttings weighed over 1 ton, and provided very good material for building the bridges and for the pitching of the river slopes. The principal feature of the new line from an engineering point of view is at little Petherick Creek, where an iron viaduct has been built. It forms a curve, and is of three spans of 130 feet, the rails being 30 feet above the mud bank and 16 feet above high water. The openings are spanned by lattice girders of wrought iron, while the land abutments are massive blocks of concrete built on the bank heads. The river piers consist of pairs of iron cylinders, 8 feet in diameter, and rest on the rock, which was found some 53 feet below the mud. The work of sinking the cylinders to this depth was very difficult. Altogether, the cylinders stand 86 feet in height, and are capped with massive slabs of granite, on which the girders rest. The girders in the viaduct weigh 350 tons, and the cylinders 200 tons, and in the abut-

ments and cylinders no less than 1,200 cubic yards of concrete were used.

This new line opens up to the Tourist another lovely spot in North Cornwall, which has hitherto been almost unknown to the travelling public. Padstow, which is a seaside and market town, is beautifully situated at the estuary of the River Camel, in the midst of a fertile valley, and is sheltered by the high grounds which surround it.

It is intended to run trains from Okehampton through to Padstow, and by certain trains there will be through carriages between London and Padstow. The journey will be performed in less than $7\frac{1}{2}$ hours.

The fishermen of Padstow will hail with satisfaction the advent of the "Iron Horse," as it is hoped that the facilities which the New Railway will afford for conveying fish will revive the fishing industry, which for some years has been on the wane, and the restoration of the old port will be a most happy move on the part of the new General Manager of the London and South Western Railway Company.

The coast around Padstow is most romantic, and many enjoyable excursions may be made.

Difficulty and delay in dealing with Cycle traffic on our Railways have largely been overcome on the London and South Western Railway by the recent introduction by that Company of bicycle labels, which will enable the Railway Staff to more effectively cope with the despatch of the machines, besides affording their owners a readier means of identification at the journey's end.

These labels, which doubtless will be eagerly availed of, can be obtained at the Booking Offices of the Company, or at Messrs. Smith and Son's bookstalls, at the small charge of one halfpenny each.

LONDON, BRIGHTON AND SOUTH COAST.

Constant travellers by the London, Brighton and South Coast Railway affirm that since Mr. Gooday has been General Manager the trains keep much better time.

It is rumoured that the Carriage and

Waggon Works are to be removed to Lewes. The accommodation at the Brighton Works being insufficient.

A sensible plan for relaying is adopted on the London, Brighton and South Coast Railway. The new "road" is laid parallel to the existing one, the new sleepers being placed alternately with those carrying the rails in use, the new rails are then placed in position a few inches beyond the ones in use. When all is ready, a couple of rails at each end of the new length of road are taken out, and the traffic diverted over the new length of permanent way. By this method a new length of line can be put down without in any way inconveniencing the traffic whilst the work is in hand.

MIDLAND.

In connection with the Easter traffic we are asked to announce the following alterations, etc. :—

On Good-Friday, the trains on the Midland Railway will run as appointed for Sundays, with the following exceptions :—The Newspaper Express leaving St. Pancras at 5.15 a.m. will run to Bedford, Leicester, Nottingham, Derby, Sheffield, and Manchester. The 8.55 a.m. Local Train, Sheffield to Leeds, etc., will await the arrival of the Newspaper Express at Sheffield. The Night Expresses will leave Glasgow at 9.30, and Edinburgh at 9.50 p.m. on Good Friday, March 31st, and proceed from Carlisle at 12.22 and 12.40 a.m. respectively, on Saturday morning, April 1st, in the same way as they are run south of Carlisle on ordinary week-days, and the 12.23 a.m. Carlisle to London will not run on Saturday morning, April 1st. The 2.58 a.m. Carlisle to Stranraer, and 8.50 p.m. Stranraer to Carlisle, in connection with steamers to and from Ireland will run on Good Friday the same as on ordinary week-days.

NORTH BRITISH.

The North British Railway Company propose to exercise in future their running powers between Perth and Blairgowrie. They do this in virtue of powers obtained as long ago as 1866.

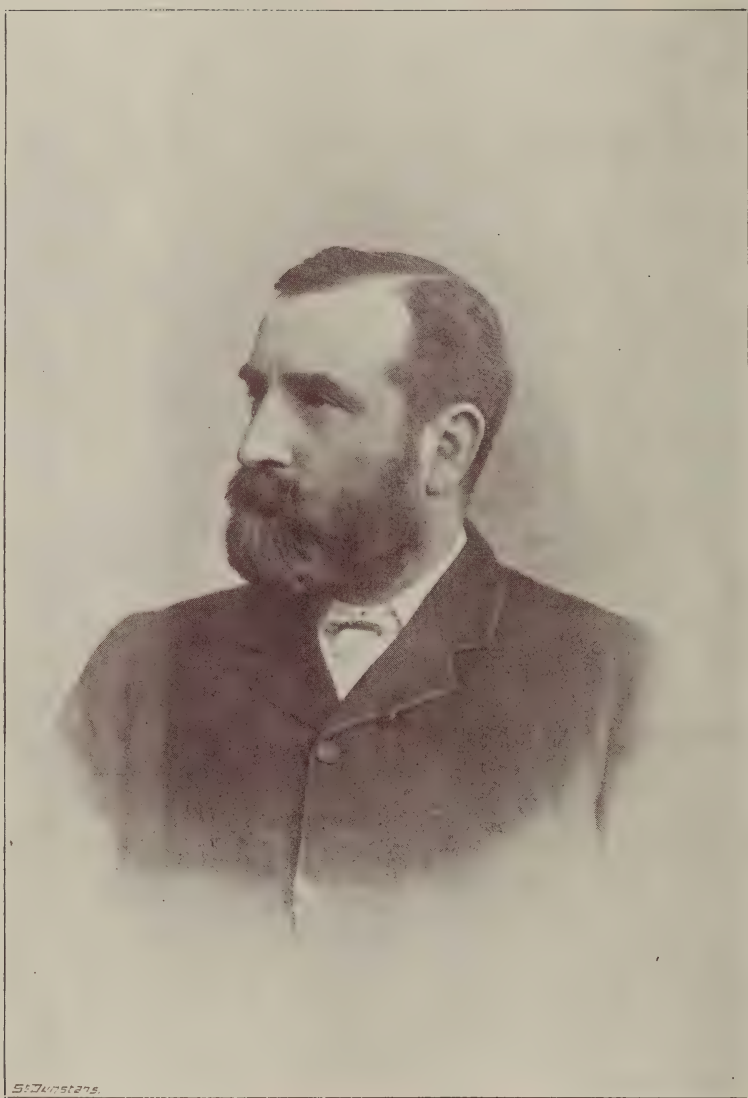
Some consternation has been caused in railway politics by the outspoken remarks of Mr. Grierson, a director and one of the largest shareholders in the North British Railway.

The charges of Mr. Grierson are directed, in the main, to two points—the appointment of Lord Elgin as director, and the item of £300,000 for outstanding accounts. The question of Lord Elgin's directorship is a minor one, but the Board will, I am informed, be able to show that everything was done in the usual and formal way. The mention of outstanding accounts is obviously intended to recall the unpleasant predicament of the Millwall Dock Company.

SOUTH EASTERN AND CHATHAM AND DOVER.

A large number of new main line coaches and "block" trains for suburban traffic have recently been delivered to the South Eastern Railway. All these vehicles are fitted with the latest improvements, the classes of the compartments of the block trains being distinguished by large numerals. When the block trains are used for running the through South Eastern trains over other companies' lines we shall hear less of the superiority of rolling stock upon which some railways so much pride themselves.

A very effective pictorial poster has just been issued. Two trains, running side by side, are passing under a signal gantry. The South Eastern engine has the coat-of-arms of that railway as a disc, at the foot of the chimney, whilst the destination board over the buffer-beam has an intimation that the train travels to Hastings from Charing Cross *via* the South Eastern Railway. The other train is a Chatham and Dover one, and the disc in this case is that Company's coat-of-arms, and the destination board states that the London, Chatham and Dover Railway train is from Victoria to Hastings. The illustration of the South Eastern engine is good, but the dome of the London, Chatham and Dover locomotive is hardly the correct colour.



Durham.

THE RAILWAY MAGAZINE

MAY, 1899

ILLUSTRATED INTERVIEWS

No. 23.—MR. DAVID MELDRUM

Manager, Cheshire Lines



“I SHOULD like, Mr. Meldrum, some account of the widely-known system of railways over which you preside. The Cheshire Lines is, of course, a joint undertaking?”

“Yes; the Cheshire Lines is a joint railway, and is the property of three Companies, viz., the Great Northern, Great Central, and Midland Companies. A considerable amount of capital has been expended upon the undertaking, and this capital has been subscribed in equal proportions by the three Railways named.”

“Has the Cheshire Lines a separate capital and shareholders, independent of the owning companies?”

“No; we have no shareholders, but we have a committee, and to that committee the Cheshire Lines officers are responsible.”

“Your answer explains the title ‘Cheshire Lines Committee,’ by which the ‘Cheshire Lines’ are usually described. How is the Managing Committee constituted, Mr. Meldrum?”

“The Committee is composed of the chairman and two other directors from

each of the parent lines, and they form a board, which meets monthly for the control and direction of all Cheshire Lines matters.”

“Why should the Railway be described as the Cheshire Lines? Is not the major portion of the system in Lancashire?”

“Yes. As you say, the title of the Railway is rather a curious one, and hardly conveys an accurate idea of its field of operations. The greater portion of the system being in the county of Lancaster—its principal termini at Liverpool and Manchester, and the large goods and passenger depôts at Stockport, Warrington, and Southport, together with the famous express road between Liverpool and Manchester, being wholly within Lancashire—it is only natural to ask how we came to adopt the title of ‘Cheshire Lines.’ This takes one back to the early history of the Railway.”

“Will you be good enough to give me an account of this early history, Mr. Meldrum?”

“Powers for building the first sections of the Cheshire Lines (or, as it was then called, the Great Northern and Manchester, Sheffield and Lincolnshire Joint Committee) were obtained in the year

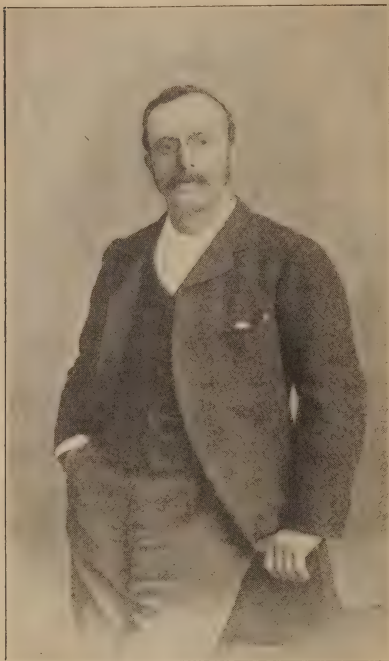
1860, for a railway from Stockport to Woodley (3 miles 72 chains) to connect

and in March, 1866, the Northwich to Helsby, and Cuddington to Winsford Branches were opened.

"At this stage there was therefore a total of 47 miles vested in the Joint Committee, made up as under :—

	Miles
"Stockport to Woodley Railway ...	2½
"Stockport, Timperley, and Altrincham Railway ...	9
"Cheshire Midland Railway ...	12¾
"West Cheshire Railway ...	22¾
	<hr/> 47 <hr/>

"The whole of these lines, with the exception of a short portion near Stockport, are within the county of Cheshire; hence it was quite appropriate, in 1866, to adopt the title of 'Cheshire Lines.' In 1861 an Act of Parliament had been obtained by the Great Northern and Manchester, Sheffield, and Lincolnshire Companies to construct a railway from Garston to



MR. GLEGGE THOMAS, F.S.I.
Secretary, Land Agent and Rating Surveyor
Cheshire Lines

with the Manchester, Sheffield, and Lincolnshire Company's Woodley and Manchester Railway, and for another extension from the Manchester, South Junction, and Altrincham Company's terminus at Altrincham to Northwich (12 miles 69 chains). The latter line was opened for traffic as far as Knutsford on May 12th, 1862, and from Knutsford to Northwich on January 1st, 1863, the Stockport to Woodley Railway being opened on the 12th January in the same year. These two sections were linked together by the Stockport, Timperley, and Altrincham Railway in February, 1866, and at the same time the branch from Woodley to Godley, giving direct access to the Sheffield, North Eastern, and Great Northern Districts was opened. Developments had also been taking place in other directions,



MR. W. G. SCOTT, M.Inst.C.E.
Engineer, Cheshire Lines

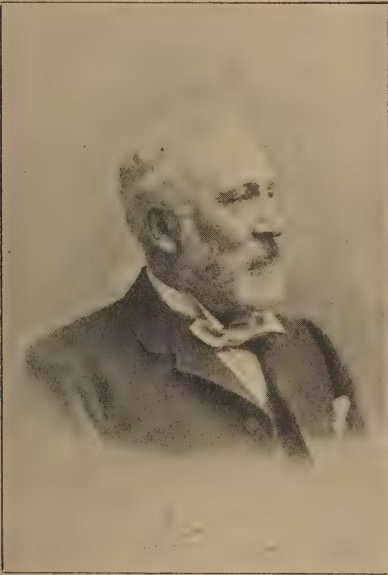
Brunswick Dock (Liverpool), and this line was opened to the public on June 1st,

1864; and to get from the Stockport section to the Liverpool section, powers had to be obtained to run over the London and North Western Company's line from Broadheath to Garston, and so form a through route from the Great Northern and Manchester, Sheffield, and Lincolnshire Companies' systems, *via* Godley and Retford to Liverpool."

"How was it the two original owners took in a third partner—the Midland?"

"On July 1st, 1866, we find the Midland Company, with an eye to future

the old terminus at Brunswick Dock, situated at the then extreme South End of



MR. R. CHARLTON

Outdoor Superintendent, Cheshire Lines

developments, joining the Great Northern and Manchester, Sheffield, and Lincolnshire Companies in the ownership of all the lines named, and in order to reach Liverpool—the pioneer port of railway enterprise, as stated above, the trains of the three Companies had to traverse the metals of the London and North Western Railway from Broadheath to Garston, *via* Lymm and Ditton, rejoining the Cheshire Lines at Garston Gates Junction, and running into



MR. JNO. YOUNG

Accountant, Cheshire Lines

Liverpool. From this point the passengers were conveyed for many years to the



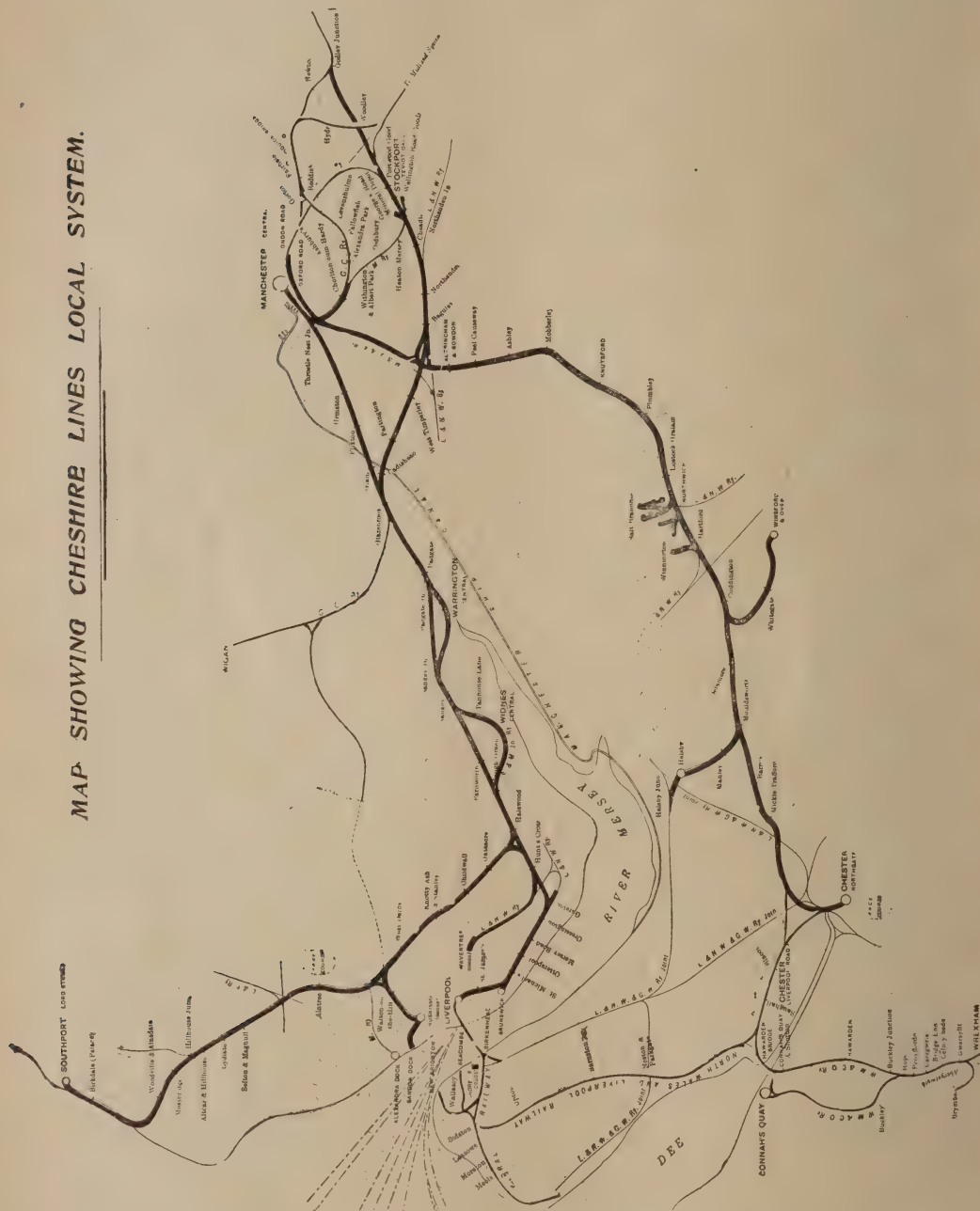
MR. S. SAXON BARTON

Storekeeper, Cheshire Lines

town by omnibuses, which were fitted with wheels the same width as the railway to

were then situated, in Alexandra Buildings. This was a very unsatisfactory arrange-

MAP SHOWING CHESHIRE LINES LOCAL SYSTEM.



enable them to run on the Dock line of rails from Brunswick to James Street, where the head offices of the Committee

ment; the transfer of passengers was annoying, and that of luggage expensive and wasteful, and we need not wonder

that, after considerable experience, the three Companies forming the Cheshire Lines arrived at a mutual determination to remedy the inconvenience. They therefore sought powers to extend the system from Brunswick Dock to Ranelagh

Street, at the bottom of Bold Street, in the centre of Liverpool, and one of the finest positions that could be obtained, being central for all points, and overlooking the busy thoroughfare of Church Street, leading direct to the Landing Stage. The Bill obtained the Royal assent in June 1866, and the work was promptly taken in hand; but although the extension was only $1\frac{3}{4}$ miles in length, it had to pass right under the city, and in consequence the progress made was slow, and it was not until the 1st March 1874, that the Central Station extension was opened for traffic. The station is considered to be a very handsome one, an effort having been made to mingle the useful with the

in Ranelagh Street has been completed with an elaboration of design not common to railway stations, which, being in their

connections essentially utilitarian, are not often permitted to exhibit architectural taste. Events have, how-

ever, induced a welcome change in this particular, and the Central Station is an evidence of this change for the better."

"The information about the omnibuses and the Liverpool extension is very interesting. RAILWAY MAGAZINE readers will be pleased to have some details of the Liverpool Central Station."

"It is a four-storied building, the ground floor being devoted to the general passenger business of the line. The upper storeys contain the Manager's, Secretary's, Engineer's, and Accountant's Departments. The station, with its offices, occupies an area of nearly five acres, and to a considerable extent is the result of excavations, the platforms, with the inter-



A STANDARD TWELVE-WHEEL BOGIE CARRIAGE, CHESHIRE LINES



ONE OF THE 7 FT. 6 IN. "SINGLE" EXPRESS ENGINES THAT HAUL THE CHESHIRE LINES "PUNCTUAL" EXPRESSES BETWEEN LIVERPOOL AND MANCHESTER

ornamental, thereby producing a railway station which is at the same time a handsome public building. The front elevation

vening docks for carriages, are 660 ft. long, and rather more than 160 ft. wide. The roof covering the chief portion of this



EXTERIOR OF THE CHESHIRE LINES CENTRAL STATION AT LIVERPOOL

area is of one span, and of segmental shape, rising to a total height of 65 ft. The tunnel by which trains enter and leave the station passes under Bold Street and the entire length of Berry Street and Great George Street. It is well ventilated throughout, and contains three separate lines of rails. The station is the terminus of three of the most important Railway Companies in England, namely, the Midland, Great Northern, and Great Central (formerly Manchester, Sheffield, and Lincolnshire), and they obtain traffic from every part of the United Kingdom. The mileage of the Midland Company is 1354½ miles, the Great Northern Company 1,066 miles, and the Great Central Company 490 miles, total 2,910½. This, added to the Cheshire Lines mileage (139) gives a grand total of 3,049½ miles. The foregoing is a total mileage not reached by many other railway companies in this country, starting from a single terminus, and it may, without exaggeration, be said that although the Central Station is the property of three Companies, it is to the traveller simply one line, which is, as already said, of greater length than many other lines starting from one station and running over its own rails."

"What extension of the Cheshire Lines next engaged the attention of the Committee, Mr. Meldrum?"

"During the construction of the Central Station the Cheshire Lines had foreseen that the opening of this station would increase their traffic into and out of Liverpool, and therefore it is not surprising that they should be found in 1866 obtaining powers to construct a railway 36½ miles in length, from Garston to Cornbrook, and from Glazebrook to Timperley. Again, in August of the same year, powers were obtained for the construction of a railway 7½ miles in length, from Mouldsworth to Chester, and, in August 1867, the whole system was consolidated by Act of Parliament, and the Cheshire Lines Committee took its place among the important rail-

way systems of England. The policy of the executive is, of course, an entirely neutral one, carried out without partiality to any of the three trunk lines, and consequently the public, as well as the companies, benefit by the unique advantages offered by this co-operation. Three routes to the Metropolis are offered to the traveller, while the trader reaps the benefit of a triple *clientele* for his wares, composed of all the towns situated near the three trunk lines. A study of the time-tables will reveal a large selection of alternative routes by which travellers may vary the monotony of their journey, and often increase its usefulness."

"I assume that, although the Cheshire Lines are owned by three important railways, you still have plenty of competition, Mr. Meldrum?"

"The Committee has fought its way against formidable competition from two powerful Companies all along its line of route, but by providing excellent and punctual services, giving first-class station accommodation, and by constructing and keeping in order a permanent way and general equipment of rolling stock, second to none, it certainly deserves the high position in public estimation to which it has undoubtedly attained. Those who remember the old Brunswick Station used for both goods and passenger service, and the line of dock omnibuses, will also remember with gratitude the opening of the Central Station in 1874. The next year, 1875, we find the Cheshire Lines extended their system into the City of Chester, the line from Mouldsworth being opened for passenger traffic on May 1, 1875, in time for the Committee to compete for the Chester Race traffic by running a service of trains from Stockport and Manchester, and as the Cheshire Line's terminus at Northgate was, and is, the nearest to the racecourse, a very large proportion of the racing fraternity were immediately secured, and the route grows in popular favour every year.



INTERIOR OF THE CHESHIRE LINES CENTRAL STATION AT LIVERPOOL

At this time [the Cheshire Lines were handicapped by having to run their Manchester trains into and out of the London Road Station, over the crowded South Junction Line from Cornbrook, and it was quickly realised that without independent access to Manchester, the growth of traffic would be stunted; it was consequently decided to build a viaduct extension of $1\frac{1}{4}$ miles from Cornbrook to the centre of Manchester, adjoining the Free Trade Hall, and close to Albert Square, the most central position in the city; and after many legal and engineering difficulties this extension was opened to the public on Monday, July 9, 1877."

"One can well understand that the Manchester extension must have been a very expensive, but at the same time important, addition to the Cheshire Lines system. Do the results arising from the independent position in Manchester adequately repay the outlay?"

"This new addition to their system placed the Cheshire Lines in the position of being able to run direct from Manchester to Liverpool without touching the rails of any other Company, and the Directors decided to at once take advantage of the improved circumstances by increasing the express service between the two cities from 16 trains per day (taking over one hour to perform the journey, and leaving at irregular times) to a splendid service of 26 express trains, leaving each terminus

at half-past every hour, from 8.30 a.m. to 9.30 p.m., and performing the journey in each direction in 45 minutes, calling at Warrington only, but some taking only 40 minutes without a stop; in addition to this great improvement the public were favoured by a reduction in fares, and the following extract taken from the *Manchester Guardian* of Saturday, July 7, 1877, will be read with interest:—

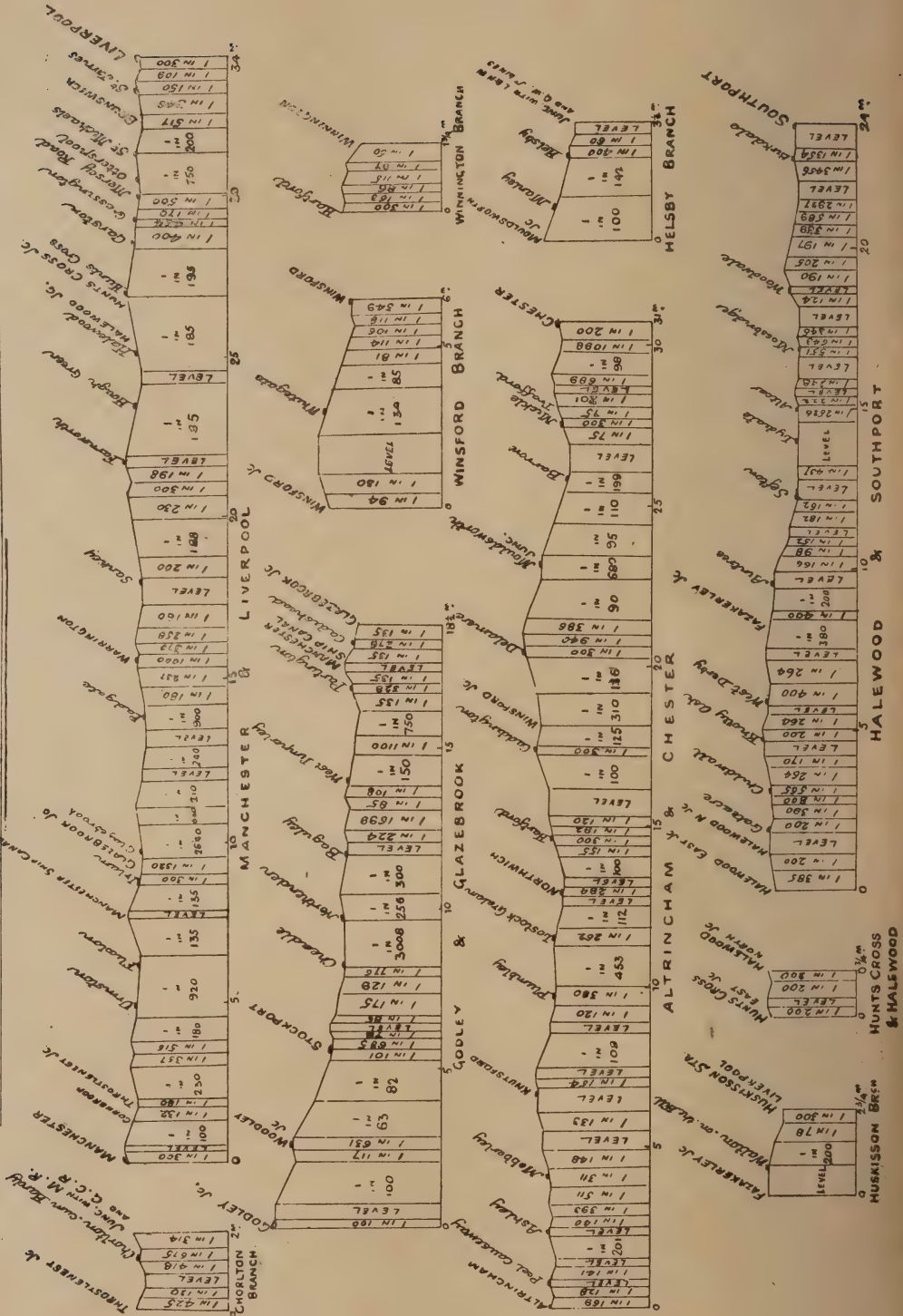
"The Cheshire Lines Committee have announced that the Central Station, Manchester, will be opened



INTERIOR OF MR. MELDRUM'S PRIVATE OFFICE, LIVERPOOL

on Monday next, and that from that date the new express train service to Warrington and Liverpool will commence. Simultaneously with this announcement comes another and equally gratifying one, namely, that the fares both to Liverpool and Warrington are to be reduced. Between Manchester and Liverpool first and second class single fares remain as heretofore, 5s. 6d. and 4s. respectively, but the third class is fixed at 2s. 6d. instead of 2s. 7½d. The return fares are reduced to 8s. first, 6s. second, and 4s. 6d. third class, being a gain to the public of 1s. 3d. on the first class, 9d. on the second, and 9d. also on the third; the return fares to Warrington are proportionately reduced. The London and North Western and Lancashire and Yorkshire Companies

GRADIENTS OF CHESHIRE LINES' RY





THE CADISHEAD VIADUCT CARRYING THE CHESHIRE LINES OVER THE MANCHESTER SHIP CANAL

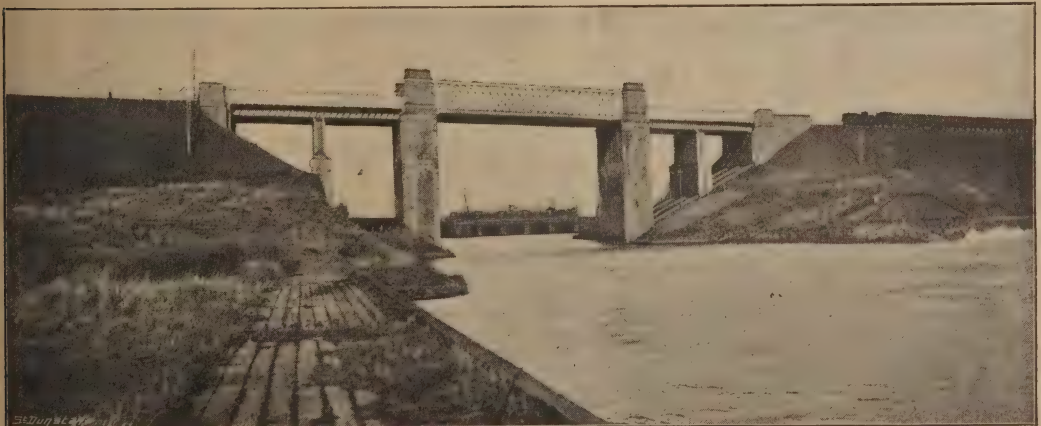
likewise intimate a reduction of the return fares by their lines ; but it is right to say that the initiative was taken by the Cheshire Lines Committee, and that it is to them, and to Sir Edward Watkin in particular, that thanks are due for the substantial advantage which is gained by the travelling public.'

"A further boon, not mentioned by the *Guardian*, was also conferred upon regular travellers by the introduction of cheap return excursion tickets at fares, one day, 2s. 9d. third class, 5s. 6d. first class, and week-end 3s. 6d. third class, and 7s. first class. It is hardly necessary to say that this excellent service and reduction in fares immediately secured the patronage of the Liverpool and Manchester citizens. Not only has the Cheshire Lines fully satisfied the most sanguine expectations of its promoters, but it has made its name famous

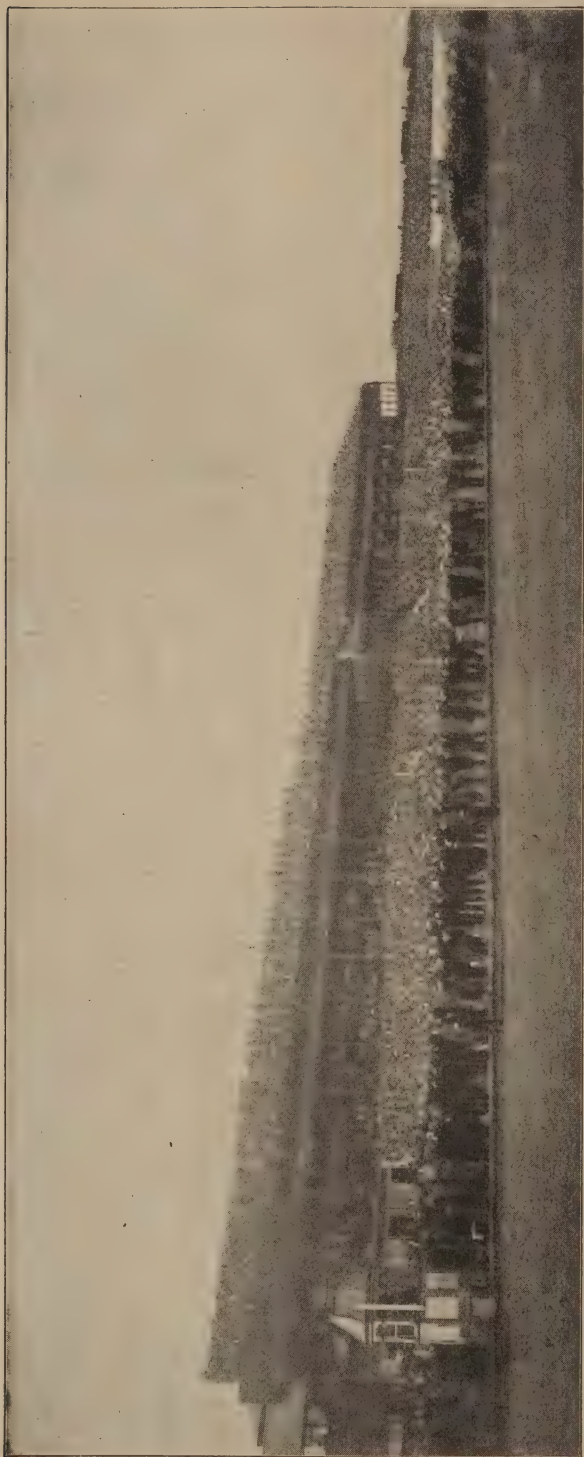
in the railway annals of this country. It inaugurated and has maintained for over 21 years the finest short service in the world—the hourly express service between Liverpool and Manchester.

"When we state that over a quarter of a million journeys have been performed by the trains on this service over a train mileage of eight and a half million miles without the loss of a single passenger's life, we think it is exceedingly creditable to the management, and as regards the title of 'Punctual Service' it is neither misleading nor misapplied."

"I believe, Mr. Meldrum, the Cheshire Lines is justly proud of the excellence of its coaching vehicles. Will you please give me some particulars of these?"



IRLAM VIADUCT CARRYING THE CHESHIRE LINES OVER THE MANCHESTER SHIP CANAL



THE GRAND STAND, AINTREE RACECOURSE, CHESHIRE LINES

"The trains forming this service are composed of six-wheeled bogie stock of the most improved type, and are for comfort and smoothness of running unsurpassed anywhere. The carriages are lighted with oil gas, which the Committee manufacture at depôts on their own line at Liverpool and Manchester. It may here be mentioned that this service shows one of the best illustrations of the effect of competition, as since the Cheshire Lines commenced to run their hourly trains, the London and North Western and Lancashire and Yorkshire Companies have followed suit, until the present service between the two cities is absolutely unrivalled, several of the Cheshire Lines trains performing the journey of 34 miles in 40 minutes without making any intermediate stop.

"At present the Cheshire Lines does not own any locomotives, the Great Central Railway supplying locomotive power under a contract. The Great Northern and Midland of course use their own engines in running their own trains over the line.

"Since the main line between Liverpool and Manchester was opened in 1877, various additional powers have been acquired by the Committee, such as the Liverpool North Extension Line from Hunts Cross and Halewood to Huskisson Dock and Aintree (Racecourse Station), 15 miles, the Warrington Straight Line (2½ miles, and

the extension from Aintree to Southport, bringing the total up to 139 miles.

"The last-named extension was constructed by the Southport and Cheshire Lines Company, and is worked under agreement by the Cheshire Lines Committee. The opening of the Liverpool North Extension Line to Aintree on December 1, 1879, enabled the Cheshire Lines to compete for the Aintree Race traffic, which had up to that time been the

line on the 1st September 1894 made the Cheshire Lines still more powerful as a competitor with neighbouring companies, and placed the Great Northern, Great Central, and Midland Railway Companies in position for the first time to run their own trains and engines direct to that favourite resort of tourists and invalids, Southport—justly styled the Montpelier of the North. The line from Aintree passes through Sefton, famous for its



ONE OF THE CHESHIRE LINES "PUNCTUAL" EXPRESSES BETWEEN LIVERPOOL AND MANCHESTER

monopoly of one Company, and as the station is close to the racecourse, the Committee have thus been placed in an excellent position for conveying their patrons from all parts of their system to the 'Grand National,' and other important race meetings."

"You certainly seem to cater in a liberal manner for the racing traffic. What important extension has the Cheshire Lines recently undertaken?"

"The opening of the Southport extension

meadow lands, which are flooded in time of frost, and provide enjoyment for thousands of Liverpool skaters; and also Altcar, where the coursing contests for the famous 'Waterloo Cup,' or blue ribbon amongst the coursing fraternity, are annually competed for. The Southport terminus is situated in Lord Street, the finest boulevard in the town, being perfectly straight and over a mile in length and unusually wide. The station adjoins the Winter Gardens and Opera House,

and an excellent service of trains is run from Southport and Birkdale to Liverpool, Manchester, Warrington, Stockport, Buxton, Matlock, Sheffield, Worksop, Nottingham, Leicester, Lincoln, Grantham, London, etc., and passengers and parcels are booked through to any part of the United Kingdom. Some of the express trains between Southport and Manchester cover the distance, $49\frac{1}{2}$ miles with one stop, in 60 minutes; no wonder therefore that Southport is a favourite place of residence for Manchester merchants who can travel between "Cottonopolis" and salubrious Southport with such expedition and in perfect comfort."

"I suppose you have other holiday traffic in addition to that to Southport, which you have just alluded to, Mr. Mel-drum?"

"Certainly, the Committee compete extensively for the enormous number of tourists and excursionists who make their way every summer to the Isle of Man, the Welsh Coast, Ireland, and Scotland, and in fact to every point where access can be obtained by the numerous steamers plying to and from Liverpool.

"*Viâ* Liverpool to the Isle of Man is by far the most popular route to the Island, the steamers provided being the largest and fastest paddle steamers afloat, and the service goes on without interruption all the year round, and during the summer months a double daily service is run, and on Saturdays it is nothing uncommon for five and six steamers to be despatched from Liverpool to Douglas, so great is the attraction of *Mona's Isle* for visitors.

"Seeing the great inconvenience and difficulties passengers had to contend with in transferring their luggage between the Central Station and the Landing Stage, in addition to the expense incurred for cabs etc., my Committee came to the conclusion that this must have a deterrent effect upon the traffic passing between the Cheshire Lines and the Isle of Man, the inconvenience at Liverpool being sufficient to

prevent many a paterfamilias from taking his wife and children to the Island for their annual holiday; and therefore arranged to establish a service of omnibuses to run between the Central Station and the landing stage to connect with all steamers going to the Island and to meet all coming therefrom, and this arrangement has proved a boon and blessing to thousands, and enabled the Liverpool route to maintain its popularity against all rivals. Passengers residing in Manchester for instance can breakfast comfortably at home and catch the 9 a.m. 'Boat Express' due at Liverpool at 9.40 a.m. On arrival the passengers are met by porters who conduct the passengers to the omnibuses and place their luggage on carts, and after a pleasant drive through some of Liverpool's busy thoroughfares arrive at the Landing Stage at 10 o'clock, and in a few minutes are comfortably aboard, say, the *Empress Queen*, *Mona's Isle*, or other crack steamers of the Isle of Man Steam Packet Company. At 10.30 a.m. prompt the boat leaves the stage and quickly passes out of the river into the Liverpool Bay, by which time luncheon is served, and after a most enjoyable two hours sail the Isle of Man is sighted, and by 2.30 p.m. the passenger is in Douglas, with part of the afternoon and all the evening at his disposal, in fact, so popular is this service that hundreds travel from Manchester to Douglas and back for one day, leaving home at nine in the morning, arriving at Douglas at 2.30 p.m., returning 4 p.m., and reaching Manchester (by the 8.30 p.m. ex Liverpool) at 9.15 p.m., covering a distance of 228 miles by rail and sea in twelve hours for an outlay of 6s. 9d. third class and fore cabin, and 9s. 9d. third class and saloon. If the passengers prefer to go for the week end (Friday or Saturday to Monday or Tuesday) the third class and fore cabin fare is 8s. 6d., and third and saloon 11s. 6d., and these modest rates include conveyance to and from the steamer at Liverpool, no

matter at what time the boats may be sailing. There is also a large traffic from the Cheshire Lines and connecting systems to the North Wales Coast, such favourite resorts as Llandudno, Bangor, Beaumaris, and Menai Straits being reached by a daily service of fast saloon paddle steamers the *St. Tudno*, *St. Elwies*, and *Snowdon* being the best known. These boats are all handsomely furnished and fitted with every convenience, and when we consider the excellent accommodation these vessels afford, the quick and delightful passage, to say nothing of the fine scenery which meets the eye as one journeys alongside the Welsh Coast, we cannot wonder that so many people use this route when on pleasure bent."

"Is there much traffic to Ireland, *via* Liverpool?"

"Oh, yes, the route from Liverpool to Ireland is one which grows in favour every year, and a very extensive

tourist traffic for that country passes over the Committee's system during the summer months. Omnibuses await the arrival of the trains and boats at Liverpool and convey through passengers and their luggage between the station and the Landing Stage free of charge.

"To return to the Cheshire Lines, it will be seen that it serves a district which is ever increasing in popularity, and therefore its future as a great carrying concern is assured, and with an energetic manage-

ment ever on the alert—*ora e sempre*—to further the interests of the Joint Committee, it is not surprising to find that since 1878 when the total number of passengers carried over the Cheshire Lines amounted to 3,926,749, the number has risen till in 1898 it amounted to nearly 11,000,000, exclusive of season ticket-holders, who number about 21,000, the tonnage carried during the same years being 1,522,090 tons for 1878, and 5,175,722 tons for 1898, being an increase of 505.086 per cent."



INTERIOR OF A CHESHIRE LINES FIRST-CLASS LAVATORY CARRIAGE

"In addition to the lines mentioned, are there not some others now forming part of the Cheshire Lines system?"

"This article would be incomplete if some further reference were not made to the two sections originally called the Cheshire Midland Railway and the West Cheshire Railway; as previously stated, the former is an extension from Altrincham (Manchester, South Junction, and Altrincham) to Northwich, and the latter from Northwich to Helsby and

Chester. These two lines give access to scenery of the finest description, noticeable *en route* being Knutsford, that charming old world town, only 14 miles from noisy, smoky Manchester, and consequently an ideal resort for the jaded townsman, who can revel in the beauties of nature here so fully provided. Next comes the anglers' resort, Plumbley, and then Lostock Gralam, where the face of nature has been wholly spoiled by hideous erections for the manufacture of chemicals, but these are not unsightly objects to the railway shareholder, who sees increased traffic and revenue in every addition to the already large community of works which have gradually extended until they really form part of Northwich, the next town, which, as everybody knows, is remarkable for its extensive salt mines and salt springs which abound in the neighbourhood; here the Cheshire Lines have laid down sidings to the different salt mines extending to nearly four miles, and convey large quantities of salt to all parts of the kingdom. Leaving Northwich, we come to Hartford and Greenbank, the station for the Vale Royal of Cheshire, and are once more in the fair meadow lands; at Cuddington, famous for its cream cheese, is a branch in a south-easterly direction to Whitegate and Winsford, also noted for its salt mines and excellent brine baths, celebrated for the cure of rheumatism, gout, lumbago, etc. Continuing on the main line we come to Delamere and Mouldsworth, situated in the heart of the Forest of Delamere, through the centre of which the line passes; the forest is a charming spot for a picnic, and is largely resorted to by visitors from Manchester, Northwich, Chester, etc. Just beyond Mouldsworth there is a branch to Manley and Helsby, at which point the Cheshire Lines' trains pass on to the London and North Western and Great Western Joint Railway to Birkenhead, where the Committee own two very large goods stations, one situated

in Shore Road adjoining the Morpeth Dock, and having direct access by rail to the Woodside lairages, shipbuilding yards, and shipping sheds, and the other at the East and West Float, where a large timber, and oil and cake traffic is dealt with.

"After leaving Mouldsworth the line passes Barrow and Mickle Trafford, and enters ancient Chester on the north side, the station being situated in Northgate Street, close to the city walls, cathedral, and within a few minutes walk of the Roodee, now used as the racecourse, and one of the oldest in the kingdom, and on this spot the Roman soldiers are said to have practised drill, and the formation of lines, squares, etc.

"On the 31st March 1890 the Great Central Company opened their extension from Chester to Buckley Junction *via* the Hawarden Bridge, at which point a connection is formed with the Wrexham, Mold and Connah's Quay Railway, thus forming a through route to the Cambrian system of North Wales from stations on the Cheshire Lines and Great Central Railways.

"The extension to Wrexham and North Wales branches from the Cheshire Lines in a south-westerly direction, 300 yards east of Northgate Station, and has opened out a most interesting and picturesque track of country for tourists, besides giving access to the valuable coal-fields of Wales. The line crosses the Dee at Connah's Quay by the largest swingbridge in the world, that of Hawarden, and the first station after leaving Connah's Quay on the Welsh side is Hawarden, the residence of the late Right Hon. W. E. Gladstone; then comes Caergwrle, formerly an important Roman station, and after passing Cefn-y-bedd and Gwersyllt, Wrexham is reached, at which point through trains pass on to the Cambrian Line, and so on to Oswestry, Welshpool, and Newtown, along the winding banks of the Dee, and pass the foot of Cader Idris to Glandovey Junction,

where the line separates going south-west to Aberystwyth, and north to Barmouth, Pwllheli, etc."

"I take it, Mr. Meldrum, that you have very cordial relations with the enterprising Cambrian Railways?"

"That is so, and during the summer months the Cheshire Lines run through carriages from Manchester (Central) to Aberystwyth and Barmouth; carriages have been specially built for this service, and they are admirably arranged with lavatory compartments for first and third class passengers, and the line passing as it does through such delightful scenery, is likely to become the most popular route from Manchester to the Cambrian district.

"Another extension across the Wirral Peninsula known as the 'North Wales and Liverpool Railway' was opened on the 18th May 1896 from near H a w a r d e n

Bridge to Bidston Junction, at which point connection is made with the Wirral Railway to New Brighton, Hoylake, West Kirby, etc., passing on the way the pleasant little fishing villages of Parkgate and Heswall-on-Dee, a district capable of great development, and from which much is expected in the future."

"Having heard so much about the extensive passenger traffic of the Cheshire Lines, readers will, I know, like some

information concerning your enormous goods and mineral traffic."

"If space permitted, I might give further details as to our extensive goods stations at Liverpool, Birkenhead, Manchester, Warrington, Stockport, and elsewhere. Suffice it to say that in this respect we are wonderfully well to the front. Hydraulic power has already been introduced at all our largest stations, and we also have adopted the electric light both



EXTERIOR OF THE CHESHIRE LINES GOODS WAREHOUSES,
BRUNSWICK STATION, LIVERPOOL

at the Manchester and the Brunswick Goods Station at Liverpool.

"I am a firm believer in the electric light for large goods and passenger stations."

"The Central at Manchester is your largest passenger station, is it not, Mr. Meldrum?"

"Yes; talking about passenger stations, Manchester Central is, of course, our largest, and we do a much larger business there than in Liverpool; the traffic consists of all kinds, both long distance traffic

and suburban, with an enormous excursion and tourist traffic during the summer months. The average number of passenger trains in and out of the station is 400 per day, and during the morning hours, say, from 8 to 10 o'clock, and in the evening from 5 to 7, there is a constant stream of season ticket holders, or 'contractors,' as they are called in this part of the world, passing from and to the station. So numerous are the arrival trains during the pressure in the morning hours that there are actually 42 trains booked to arrive at the station between 8 and 10 a.m., giving an average arrival of a train every three minutes. I predict a very large development of this description of traffic, not only at Manchester but at Liverpool, for the tendency is growing amongst business men in particular to get away from town the moment their work is over, and on our line there are numerous delightful spots within easy reach of both Liverpool and Manchester, and there is a very good service of trains."

"What do you think about the automatic couplings' farce that has lately been played at Westminster, Mr. Meldrum?"

"As regards the automatic coupling question, the whole thing has been a mistake, and I daresay those responsible for the proposal are now beginning to see it."

"And now, Mr. Meldrum, as to your own railway career?"

"As regards my own career, I may briefly say that I entered upon my present position as Manager of the Cheshire Lines on 1st October 1882. Previous to that I was for fully 10 years in the service of the London and North Western and Great Western Joint Companies at the General Station at Chester, where I had full charge of all traffic matters."

"My other experience has been gained on Indian Railways and in Scotland, and, like many others, I started very young—first as a junior clerk on a little line called the Edinburgh, Perth and Dundee Railway—long since merged in the

North British, but it proved good training ground, for on that small line I secured a good all-round apprenticeship, passing in succession through the coaching, goods, audit office, Goods Manager and General Manager's Departments, and, in fact, had a little of nearly every department—not forgetting out-door working—and this general all-round training has proved of very great service to me throughout my after life."

"The Cheshire Lines, although a joint undertaking, is worked pretty much upon the same lines as an independent undertaking, hence we have a full staff of officers just the same as any other railway."

"Mr. W. G. Scott, M. Inst. C.E., is our Engineer-in-Chief, and has held that position for 25 years, having previously been in the service of the old Manchester, Sheffield and Lincolnshire Company (now Great Central) as District Engineer."

"Mr. Glegge Thomas is our Secretary, Estate Agent and Rating Surveyor, and has been with the Cheshire Lines for 21 years. He is a Fellow of the Surveyors Institution."

"Mr. John Young is our Chief Accountant, and has been in our service since August 1896, having previously been connected with the Accountant's Department of the London, Chatham and Dover Railway."

"Mr. S. Saxon Barton is our store-keeper, and has held that position for 11 years, but he has served the Committee 24 years altogether, having been previously in the Engineering Department."

"Mr. Robert Charlton is our out-door Superintendent, and my trusted right-hand man in all matters connected with train working, signals, etc., he has been with the Committee since 1868."

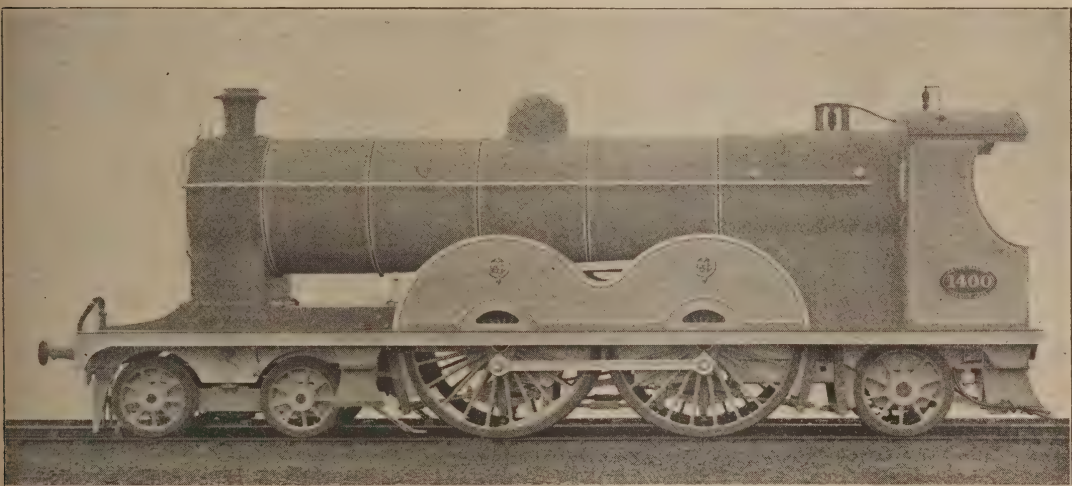
"Thank you, I must not detain you longer, Mr. Meldrum. Allow me to most heartily thank you for the information concerning the Cheshire Lines Committee you have afforded me on behalf of RAILWAY MAGAZINE readers." G. A. SEKON.

THE LATEST LOCOMOTIVE GIANT



THE photograph reproduced below illustrates the new 10-wheel express engine just built at the Horwich works of the Lancashire and Yorkshire Railway from the designs of Mr. J. A. F. Aspinall, M.Inst.C.E., the Company's chief mechanical engineer. No. "1400," it will be noticed, is a distinct advance on the many excellent types already introduced

weight loaded, bogie, 12 tons 5 cwt. driving, 17 tons 10 cwt.; trailing coupled, 17 tons 10 cwt.; hind, 11 tons 10 cwt.; total weight, 58 tons 15 cwt. Boiler, diameter, 4 ft. 10 ins.; length between tube plates, 15 ft.; firebox shell, length, 8 ft. 1 in.; width, 4 ft. 1 in.; copperbox 6 ft. 11½ in. high, 7 ft. 5⅝ in. long. Tubes, No. 239, outside diameter, 2 in.; heating surface: tubes, 1877 superficial feet; firebox, 175·8; grate, 26·05 ft. Weight of



No. "1400," LANCASHIRE AND YORKSHIRE RAILWAY—THE FIRST OF MR. ASPINALL'S NEW MAMMOTH LOCOMOTIVES

by Mr. Aspinall, and a glance at the dimensions given below (kindly supplied by Mr. Aspinall) will show the leading measurements of the new giant. They are as follows:—

Cylinders, diameter 19 in. by 26 in. stroke; wheels, bogie, diameter 3 ft. ½ in.; coupled, diameter, 7 ft. 3 in.; hind, diameter, 3 ft. 7¾ in.; wheel base, 27 ft. 9 in.; centre of bogie to driving, 10 ft. 2½ in.; driving to trailing, coupled, 7 ft. 6 in.; trailing coupled to hind wheel, 7 ft. 3½ in.;

tender, loaded, 30 tons 13 cwt. 1 qr. Tank capacity, 2290 gallons. Twenty of these engines are to be built, and although they will be known as the "1400" class, the numbers will not follow consecutively, but any vacant numbers will be filled in as the engines are completed. No. 1392, the second of the type, is almost completed.

We hope to present RAILWAY MAGAZINE readers with a coloured plate of No. "1400" and her tender with the next month's issue of the Magazine.

THE SOUTHWOLD RAILWAY

BY SCOTT DAMANT

THE delightful little toy railway" is how a certain "enterprising lady journalist" has described the Southwold Line. As it runs through picturesque scenery to a quaint old-world borough on an ozone-laden shore it may perhaps accurately be described as "delightful." As its total length is $8\frac{3}{4}$ miles it may certainly be called "little." As last year it carried close upon 100,000 passengers, the Southwold Railway may surely claim to be something more than a "toy."

The old Suffolk port of Southwold is situated at the mouth of the Blyth, overlooking Sole Bay, thus taking a midway place on the coast between Aldborough and Lowestoft. Known variously

in olden times as Suwald, Suwalda, Sudholda, Southwaud, and Southwood, it has been in its time a place of very considerable importance. It was off Southwold, in 1672, that the combined English and French fleets defeated the Dutch. The allies were under the command of the Duke of York, then Lord High Admiral of the Fleet, afterwards King James II. The house occupied by our last Stuart King when at Southwold still stands intact. With its beautifully - moulded ceilings and rich carving, it is probably

one of the finest specimens of a seventeenth-century town residence in existence.

But the sea encroached somewhat upon Southwold, and, in course of time, it fell from its high estate, although never to such an extent as its neighbour, Dunwich; for Dunwich was once a powerful episcopal city and the capital of East Anglia. Now the German Ocean rolls remorselessly over all that remains of several stately churches and the busy city built around them. Practically nothing is left; even



Photo]

SOUTHWOLD BEACH

[Payne Jennings

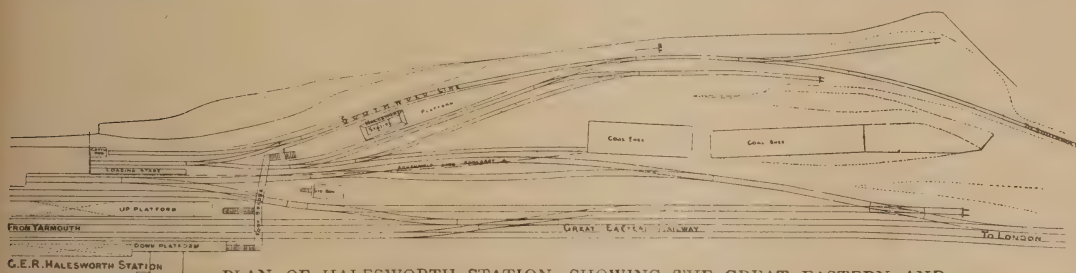
the Bishop's Palace has long since been submerged. A straggling village there is indeed, but it possesses little but its name to remind us of its past.

Sea encroachment has not been the only cause to militate against the too rapid development of Southwold in the past. Towards the close of the last century and the beginning of this, the bulk of its population was engaged in a very pleasing and prosperous foreign trade, principally in wines, spirits, silks, lace, and tobacco. The honest (!) sea-faring folk

there appear to have displayed considerable enterprise in this business—mostly of a night-time. Viewed dispassionately, it is perhaps to be regretted that in one respect they showed much thoughtlessness. They quite forgot the existence of such things as customs tariffs, and even seem to have gone out of their way to avoid the revenue officers. Unfortunately the Government of the day did not call it "thoughtlessness." They called it smuggling, and hanged or imprisoned all they caught engaged in the business. Then the press-gang paid many visits to Southwold, and took off bodily all the young men available for service in His Majesty's navy. So the youth of Southwold helped to man "the wooden walls of England." They added to the prosperity of their

the two following decades. One singularly unfortunate effort was made to connect Southwold with the interior by means of a steam tram. It was not found possible to raise sufficient money, and several of the local residents were finally sued for the balance of the amount due on their shares in order to pay promotion expenses.

At last, in 1875, practical steps were really taken towards solving the difficulty of providing railway accommodation at comparatively low cost. Two meetings were held in October of that year—one at Halesworth, under the presidency of the late Mr. Charles Easton, of Easton Hall, and one at Southwold, when the late Earl of Stradbroke occupied the chair. Both chairmen were large local landowners,



PLAN OF HALESWORTH STATION, SHOWING THE GREAT EASTERN AND SOUTHWOLD RAILWAYS

country at large but not to that of their own native place; for when peace came in 1815, Southwold, like many other small ports, was inhabited chiefly by women, children, and old men.

Although matters had of course improved when a quarter of a century later the railways in East Anglia were being planned, it is not altogether to be wondered at that Southwold was left out in the cold. Nevertheless, it was obvious that a town offering so many advantages as a watering-place could not always remain without railway accommodation, and in 1855 an agitation was started to induce the East Suffolk Railway Company to construct a branch from Halesworth. Nothing came of it, nor of the many subsequent schemes that were mooted during

and their presence and support naturally inspired a general feeling of confidence. This feeling was further enhanced by the active interest taken in the undertaking by the late Mr. Richard Rapier, of the well-known Ipswich firm of engineers, Messrs. Ransomes and Rapier, and by Mr. Arthur C. Pain, a civil engineer, whose experience of light railways was and is very extensive.

At these meetings Mr. Pain explained that the idea was to build a light railway of a gauge of 2 ft. 6 in., which would not only be very much cheaper to make than a railway of the ordinary gauge, but would cost far less for future maintenance. Mr. Rapier announced that he had constructed an engine as an experiment suitable for running on a gauge of 2 ft. 6 in.

He had succeeded in building one weighing only 25 cwt., and it travelled at the rate of 20 miles an hour with a load weighing 20 tons. This statement was greeted with loud applause, and at both meetings the following resolution was unanimously carried:—"This meeting, having heard the description of the projected railway from Halesworth to Southwold, is of opinion that the two towns and intervening district would be greatly benefited by it, and this meeting warmly approves the proposal."

thought when the scheme was first broached. As a matter of practical experience, it has been found necessary to raise as much as £77,000 in stock shares and loans, of which amount £71,810 had actually been spent at the close of last year.

If the Company has not been altogether as financially successful as its more sanguine promoters expected, its shareholders have, at least, the satisfaction of knowing their enterprise has materially benefited the neighbourhood served by



SOUTHWOLD RAILWAY NARROW GAUGE TRUCKS LOADED ON GREAT EASTERN RAILWAY NORMAL GAUGE VEHICLES EN ROUTE FOR THE SOUTHWOLD RAILWAY

The next year saw the "Southwold Railway Act" duly passed, and towards the close of 1879 the railway was actually opened. Several modifications in the original scheme had become necessary. For instance, the proposed gauge of 2 ft. 6 in. was discarded in favour of a gauge of 3 feet. This, no doubt, partly accounts for the fact that the original estimate of the capital expenditure has been considerably exceeded. £40,000 was the outside figure required, so it was

the railway. Thousands of persons have been tempted to visit Southwold who but for the facilities offered would never have undertaken the journey. Having visited it once, they come again, for Southwold possesses a distinct individuality of its own. The blue waters of its bay and the golden yellow of its sands are, of course, lost in the accompanying picture; nevertheless, Mr. Payne Jennings has, with his usual felicity, most aptly caught the characteristics of its beach. From March to

October, inclusive, last year, the total number of passengers carried from Great Eastern London and suburban stations to Southwold amounted to 8,530. Nor has the town of Southwold alone benefited. At each of the three villages *en route* where there is a station—Wenhaston, Blythburgh, and Walberswick, to wit—there is a magnificent old church. Each of these churches has its own distinct points, although in general characteristics they are alike, being pre-Reformation Monastic buildings. If in some respects they fall before the grandeur of Southwold Church, they have many attractions for archæologists and painters, who have not been

Mr. Richard C. Rapier, of whom mention has already been made, was elected Chairman when the Company was first formed, and retained that post until his death, which occurred a couple of years ago. Mr. Rapier was succeeded by Mr. Charles Chambers, the present Chairman, who joined the Board in 1889.

As might be expected in a county so generally level as Suffolk, the construction of the railway did not present any great engineering difficulties. The earthworks throughout are light, the deepest cutting being about 20 ft., and the highest bank 12 ft., the banks exceeding the cuttings in quantity. The steepest gradient

is 1 in 53 for a short length in one of the approaches to the swing bridge over the River Blyth, between Walberswick and Southwold. This swing bridge has a wrought iron bow-string girder, the turning centre being on a wrought iron cylinder, the



"SOUTHWOLD," A NARROW GAUGE LOCOMOTIVE BUILT BY SHARPE, STEWART AND CO. FOR THE SOUTHWOLD RAILWAY

slow to take advantage of the railway to visit them. Thus in 1880 the total number of passengers carried by the Southwold Railway was 65,749; last year the number had risen to 93,798. But the increased traffic of the railway has not been confined to passengers. In 1880, 9,854 parcels were carried; last year the number was 31,161. Again, in 1880 the goods traffic amounted to 1,960 tons, and the mineral traffic to 3,012 tons; last year the figures were 5,346 and 6,664 tons, respectively. These figures are a just cause of satisfaction to Mr. Arthur C. Pain, the Managing Director, and to Mr. H. Carne, who, since 1884, has been Secretary to the Company.

approach openings to this being of timber, the piles supporting same being encased in timber. This is far and away the most expensive of the thirteen bridges on the line. The authorities insisted that a swing bridge should be provided; but it has been very seldom opened for traffic since the line was built. The fact is, the maritime trade of Southwold has practically gone. This has been attributed to the obstruction of the channel by the pier of the railway bridge, but it is far more due to the faulty construction of the two piers of Southwold, erected in 1749 and 1752, respectively. The width between them is too great, affording as it does room

enough for the discharge of a far more powerful river than the Blyth. Further, they are placed in such directions, with respect to each other, that the power of the river as a scouring agent is so mitigated on passing the pier-heads that it has scarcely any effect on the bar. Lastly, they are so placed with reference to the line of coast that when the ebb streams of the river and sea meet they act as

The Southwold Railway is essentially a "light" railway in the matter of its permanent way, which consists of flat-bottomed rails, in 21 ft. lengths, weighing 30 lbs. per yard, fished at the joints with two plates weighing about 5 lbs. the pair, fastened with four $\frac{1}{2}$ inch diameter bolts, weighing $\frac{1}{4}$ lb. each. At the joints there is a clip sole plate, 3 in. wide by $\frac{5}{16}$ in. thick, weighing 2 lbs., fastened



A VIEW OF THE SOUTHWOLD RAILWAY

opposing forces. Altogether, the state of affairs has been aptly described by Mr. H. Savile Clark :—

"The harbour is empty, and under

The worn planks there burrows the foam :

The surf on the bar breaks like thunder,

And never a ship finds a home.

With ghost-giving moonlight one fancies

The wraiths of old navies appear,

And weirdly the war pennon dances

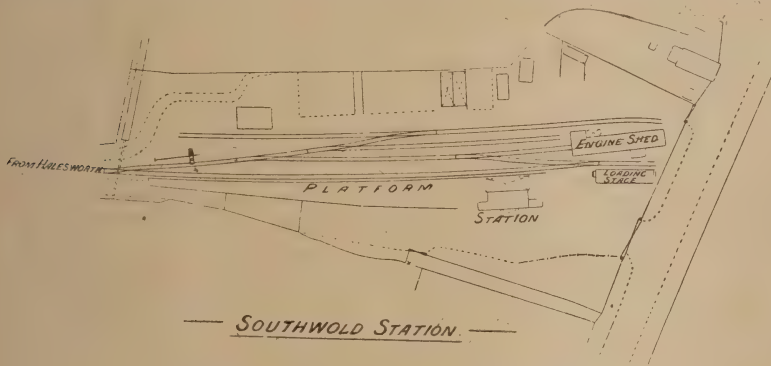
By Walberswick Pier."

with two fang bolts, $\frac{1}{2}$ in. diameter and 5 in. long. There are nine rectangular sleepers, 6 ft. by 6 in. by 3 in. to the 21 ft. rail, the rails being fastened to these by dog spikes, and at every third sleeper a single clip sole plate, weighing 1.6 lb. each, these being attached with one fang bolt and one dog spike, $\frac{1}{2}$ in. square, $4\frac{1}{4}$ in. long.

This lightly-laid permanent way is

found amply sufficient to bear the weight of the rolling stock, which is correspondingly light, although, needless to say, the locomotives weigh very considerably more than the 25 cwt. model of Mr. Ravier, to which reference has already been made. The coaches are built on the tram-car principle, and are not unlike those in use on the Wisbech and Upwell trams, as described in the February number of *THE RAILWAY MAGAZINE*.

The station accommodation on the Southwold Railway could not with accuracy be termed extensive, but it meets the requirements of the line. At Halesworth the goods are transferred from the Great Eastern by means of a timber stage, 5ft.



PLAN OF THE TERMINUS AT SOUTHWOLD.

wide, between the two roads, the floor of the wagons in each case being slightly above the level of the stage so as to freely permit the running of barrows from truck to truck. There are no goods sheds or cranes on the line. The transshipping at Halesworth is all done by hand, the Southwold Company's porters being employed for that purpose.

Of course in the matter of a narrow gauge line there is a good deal to be said *pro* and *con*, but the general consensus of opinion is probably against any deviation from the standard gauge. Mr. Pain, however, always maintains that the disadvantages of a narrow-gauge line are over-rated. As far as "claims" are concerned from the owning Company's point of view, a narrow

gauge probably does possess some advantage. Of course all railway men are agreed that the idea of goods being broken or damaged when in transit on a railway is preposterous and absurd. Unfortunately traders and the public generally can seldom be converted to that view. As a consequence when a consignment, say of china from the Potteries, gets a trifle bent on the way a "claim" follows. Then the railway officials, conscious of their own immaculate rectitude and the impeccability of their line, repudiate, expostulate, pay, and look pleasant—or try to. When the traffic in question has passed over several systems, the officials of each line protest that, in the very unlikely event of any damage having occurred at all, it could not possibly have happened on their particular railway. None the less, the amount of the claim is divided by mileage; each company bearing its

proportion of the loss, not indeed as an admission of liability, but rather as an example of pious charity and kindly generosity for the edification of the others. Now when goods are being transhipped at Halesworth, if they appear to be in any way damaged the fact is noticed, and the Southwold Company is able to successfully repudiate any responsibility. This, it may be argued, is a knife that cuts both ways. So it is; but a break-neck speed of some fifteen miles an hour is at least fairly safe, and mishaps on the Southwold Railway are few and far between.

Nowadays, when there are so many schemes for light railways under discussion, those interested in them would do

well to undertake a journey on the Southwold Railway. They will see much to interest them, apart from which fact they will find the air of Southwold singularly invigorating. The scenery along the line and round Southwold is exceptionally pretty. There are miles of land covered with a bright yellow gorse, and several acres devoted to pine trees, more reminiscent of Bournemouth than anything else in East Anglia. To the pedestrian and the cyclist the surrounding district offers many attractions. Dunwich, *via* Pontoon Ferry at Blackshore Quay, is only four miles away. Reydon, a mile and a half off, possesses a grand old Gothic church; Wangford, where once there stood a famous priory, also has a fine old church; and at Blythburgh there are the ruins of an important Augustinian Priory; while Henham Hall, the seat of the Earl of Stradbroke, is a handsome eighteenth century mansion. The gardens

and park are open to visitors on certain days in the week. In June, Southwold is particularly attractive, for wild flowers of many varieties are plentiful, and the air is heavy with the scent of the honeysuckle with which the hedges abound. There is, therefore, small cause for wonder that the Directors of the Southwold Railway Company are enabled to say in their last half-yearly report—"The accounts show a satisfactory increase from all sources of traffic." There is, however, cause for wonder in the next clause of the report: "The working expenses under maintenance are less; under other heads they are slightly increased, but the result is a less amount on gross total expended." In these days when the railway companies are worried by irresponsible agitation and harassed by uncalled for legislation, that sentence is likely to give rise to a sigh of envy on the part of many a shareholder in larger and more prosperous concerns.



A RAILWAY WAR IN INDIA

By J. T. LAWRENCE, M.A.



BY the time this appears in print, it is quite possible a treaty of peace may have been signed; but, at all events, the history of railway matters in India has been so interesting during the past six months as to deserve record. It has been to some extent a "battle of the gauges," the South Indian and the Southern Mahratta Railways, *versus* the Great Indian Peninsula, Madras, and East Coast Railways. And, at the moment of writing, the narrow gauge seems to have the best of it. The accompanying map will show how the various railways concerned lie with regard to each other, and the first thing to be observed is the extraordinary way the narrow gauge has got itself mixed up with the broad.

Look for instance at Guntakul and Bangalore. The former is on the broad gauge through route from Bombay to Madras. The latter is an important military station, and one of the largest cities in Southern India; and yet a through train from Bombay to Bangalore is an impossibility, except by making a detour of nearly 300 miles and losing 12 hours.

Bellary is another important military station, and it is impossible to get there at all except by detraining, either at Guntakul from Madras, or Hotgi from Bombay. When we say impossible we mean, of course, for the ordinarily constituted human being who is careful both of his time and his comfort. It will, however, be observed that a through route does exist—narrow gauge throughout. Leaving Madras by the Southern Indian Railway a change is made at Villapuram, whence,

after a long and devious journey, Guntakul is reached, and eventually Bellary.

This would not suit an ordinary passenger, but goods are not so sensitive, and consequently the Madras Railway Company have recently awoke to the fact that their goods receipts from their North West Line have been steadily diminishing for some time past. The South Indian and Southern Mahratta have been making friends and concluding a treaty as to rates, and the result is, the broad gauge seems to be very much out of it.

But it will be seen that the Southern Mahratta tap the Great Indian Peninsula Railway at other important points—at Poona and Hotgi—and traders have been finding it cheaper to send goods from Bombay to Madras by suffering a transfer to the narrow gauge at Poona. This cutting of rates could not exist had the possibility of competition been assumed when the Southern Mahratta was suffered to extend its claws in all directions.

The working expenses of a narrow gauge line are, of course, considerably less than those of a broad gauge, and in making any treaty this fact will have to be seriously considered and the broad gauge rates levelled down.

By its working arrangement with the South Indian, the Southern Mahratta has obtained access to ports both on the east and west coast—to Morma Goa on the west, and Pondicherry, Cuddalore, Negapatam, and Tuticorin on the east.

Tuticorin means Ceylon, and Negapatam means Singapore in the first place, and secondly all the northern coast ports.

The fatuous policy which has guided the New East Coast Line throughout has allowed

it to carefully avoid the important ports of Cocanda, Veragapatam, and Bimlipatam, the two first of these being the termini of branches. Masulipatam, 48 miles from Berwada, is out of it altogether; but the Southern Mahratta, which is already at the latter station, is reported to be engaged in an attempt to "square" the

sess great possibilities as a port, at present, at all events. It is but an open roadstead, and such harbour as there is can at present only accommodate lighters, and it is, moreover, protected by a bar. The advent of a wealthy corporation such as the Southern Mahratta Railway will, however, be sure to make some difference,

and Masulipatam has, of course, everything to gain and nothing to lose by the proposal.

Goa certainly is a foreign port, and the West India Portuguese Railway, which forms the narrow gauge extension from British territory, is chronically impecunious. It is guaranteed by the Portuguese Government; but rumour has it that the whole revenues of the settlement are not able to make up the guarantee. Any agreement with the Southern Mahratta Railway would



Masulipatam authorities, with the view of providing a narrow gauge extension.

This proposed extension is shown on the map by a dotted line, and it will be seen that the Southern Mahratta will in that case connect ports on both the east and west coasts by their own metals. In that case it will be a question how far or how long the arrangement with the South Indian will last. It may be remarked, however, that Masulipatam does not pos-

therefore be to its benefit.

A trump card with the broad gauge interests would be to keep the Southern Mahratta Railway on their own side of the Kistna Bridge, i.e., the south, and as Masulipatam is on the north side of that river, such a proceeding would nip this little proposal in the bud. It has not been suggested yet though, and, in fact, the East Coast Railway has no particular interests in common with either the Ma-

dras Railway or the Great Indian Peninsula Railway. Their friendship might mean nothing, whereas the enmity of the the Southern Mahratta Railway might produce serious results.

It might almost be worth the while of the broad gauge companies to allow the Southern Mahratta Extension, as in that case the relationship of that company with the South Indian would enter upon an

higher speed than is possible either by Southern Mahratta engines—an engraving of one of which illustrates this article—or on the Southern Mahratta permanent way. But then passenger traffic is barely worth fighting for in India, certainly not first and second class. The third class is fairly lucrative, but passenger fares are a fixed quantity; all the same, the ordinary native passenger would gladly travel 200 miles



No. 129. A 6-COUPLED ENGINE, SOUTHERN MAHRATTA RAILWAY.

entirely new phase. At present the South Indian holds all the ports from Madras to the southward, and the whole of the produce of the Deccan can be collected by the Southern Mahratta Railway, and then, *via* Guntakul, Dharmavevam, and Kalpadi, find its way to Cuddalore or Negapatam, or even to Madras.

As far as passenger traffic is concerned, probably the broad gauge companies are not affected; their trains run at a much

further round and lose 24 hours if he saw his way to saving a couple of annas on the transaction.

It will be observed that the west coast is in a very much more unfavourable condition as regards railway accommodation than the east. This is all the fault of the south-west monsoon, which, for several months out of the twelve, renders every Malabar port, with the exception of Bombay and Goa, unapproachable.

RECOLLECTIONS OF EARLY LOCOMOTIVES

BY ISAAC W. BOULTON



ON looking back to the early days of the locomotive engine, I often think of the prejudice that existed in the minds of our early locomotive engineers against horizontal cylinders.

Edward Bury always claimed to have made his first inside cylinder loco-engine in 1829, and, accepting his statement, he was the first to introduce horizontal cylinders.

Inside cylinders, crank axle, bar framing, high top fire-box, and a peculiar wheel with cast-iron box were his specialities, and did wonders about Wigan, St. Helens, London and Birmingham, the Midlands, &c.

Although my memory takes me back to a period anterior to the Rainhill locomotive trials, I do not recollect seeing or hearing anything of horizontal steam cylinders previous and up to the trial of locomotives on the Liverpool and Manchester Railway. As most readers probably know, two of those engines had vertical cylinders, and the successful one "Rocket" had her cylinders to begin with at a very considerable angle, almost vertical, which were afterwards lowered almost to horizontal, and this was also the first to give engineers confidence in

horizontal cylinders; but of course the secret of the success of the "Rocket" was in her boiler, the fire-box and tubes being suggested by Mr. Booth to Mr. Stephenson.

I have often heard the credit given to Mr. Booth for the fire-box and tubes of the "Rocket," but have long been convinced that the idea did not originate with

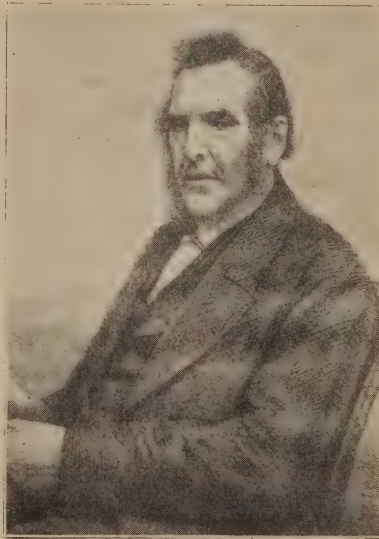
Mr. Booth. I believe it came from France.

Most of us know today that the all-important part of a locomotive is the boiler, plenty of space in the fire-box and tubes, a proper blast-pipe, and say 120 to 150 lbs. or more pressure.

The "Rocket" underwent considerable alterations after the trial; the boiler was not originally intended to have a fire-box, that was added, and the water space coupled up to the barrel of the boiler by a copper pipe on each side; her smoke box was put

on the front, and considerably more tubes introduced and cylinders lowered to nearly horizontal position.

I can recollect when 65 lbs. pressure was the tip-top, and it took a good man to maintain that. Referring again to prejudice against horizontal cylinders, the idea was that the weight of the piston would wear the bottom of the cylinders



RICHARD ROBERTS

A Pioneer of Locomotive Construction, and Founder of the Firm of Sharp, Stewart & Co.

oval, and even Mr. Richard Roberts, the noted locomotive engineer of fifty years ago, held this prejudice, right up to the time of his making the locomotives for the Dublin and Kingstown Railway, which had vertical cylinders standing on the outside frame and coupling up to the wheels with L levers and connecting rods; of course, ultimately, the railway world had to thank "old Dicky" Roberts for some of the best engines that were turned out.

When we get down to A.D. 1835 or 1840, I think we must thank Mr. Roberts for what was known in its day as the "Pow" Engine, which means the revers-

and as it stood one day in steam at Long-sight Locomotive Depôt, previous to my buying it, I saw an old friend, who was then a steam-shed foreman, get on the foot-plate of this engine, intending to run her about, but for the life of him he could not move her.

Edwin Bury's four-wheeled passenger engines did wonderfully well during the latter part of the thirties, all the forties, and on the London and Birmingham section of the London and North-Western Railway during the Exhibition year (1851), these four-wheeled engines were still largely employed.

About 35 years ago there was a great demand amongst contractors for light, powerful, and cheap tank locomotives, and an old friend, William Sissons, contractor, of Hull, who had some work to do for the Dock Company there, required an engine light enough to run over some of the dock swing-bridges without danger.

The locomotive engine "Shark" (a single-wheel outside cylinder passenger engine, with tender), which opened the Grand Junction Railway in 1837, was in my stock, and I took her to Mr. Sissons, at Hull. In a short time the Dock Company's engineer complained that she was too heavy for the bridges, and I had to find them a lighter engine which I did efficiently, but in a funny manner.

I had an old Edward Bury four-wheeled passenger engine, with 5 ft. 6 in. driving wheels and 3 ft. 6 in. leading wheels, 12 in. cylinders, 18 in. stroke, high-topped fire-box, and hand-gear valve motion. I pulled her driving-wheels off and put the 3 ft. 6 in. leading wheels in their place. I then placed a pair of wheels 2 ft. in



ROBERTS' "HIBERNIA," DUBLIN AND KINGSTOWN RAILWAY, 1834

ing lever, which an engine-man could handle and reverse with one hand, leaving the other at liberty to shut or open the regulator.

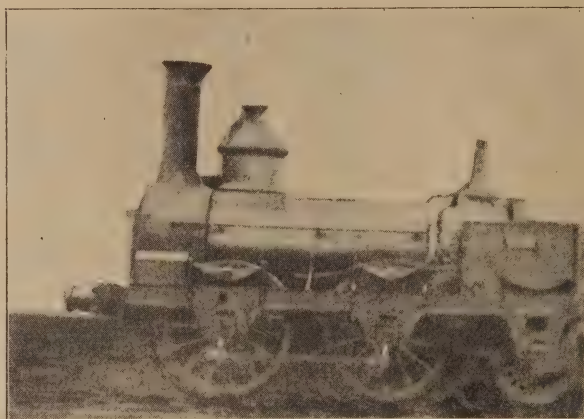
Edward Bury introduced a complicated but effective reversing hand-gear valve motion, which required both hands and one foot to handle, and the regulator had to take its chance. This reversing-gear had two levers, one to each valve, and you could give by hand each piston at the proper time the full force of the steam like a shot from a gun.

I have often started a heavy load by the hand gear which the engine would not start at all with the eccentrics on gear.

I recollect about 35 years ago one of this type of engines came into my hands,

diameter in front, a saddle-tank on her back, and a small coal-box behind the foot-plate.

I ran her myself one Sunday in steam over the Manchester, Sheffield and Lincolnshire Railway from Guide Bridge to New Holland, where she was placed on a barge and so taken across to Hull, where she finished the job satisfactorily.



A RAILWAY ENGINE DRIVEN THROUGH THE STREETS OF ASHTON ON 7TH AUGUST 1865

This engine ultimately went to work on the beach somewhere about Wisbeach, and finally was lost in the sea.

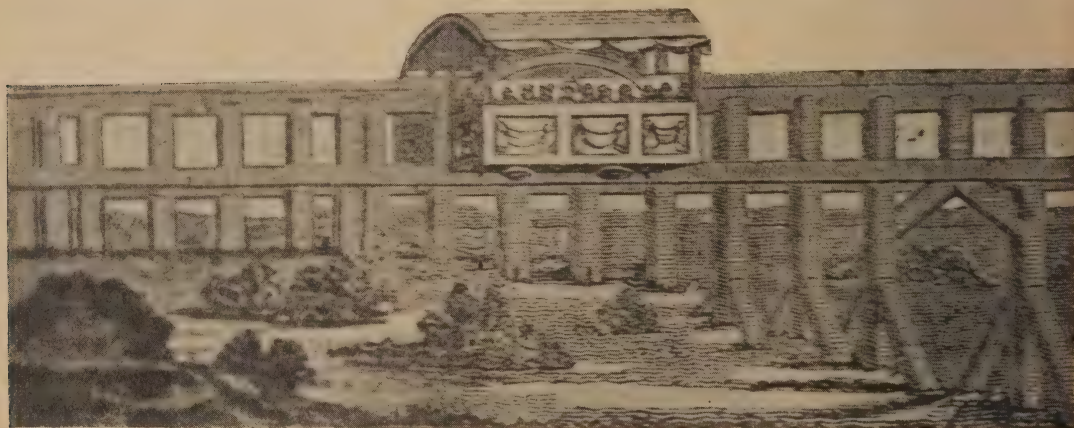
Thirty-four years ago I drove the locomotive illustrated above, in steam, through the streets of Ashton-under-Lyne, without anybody interfering with me. What would a modern County Council say to such conduct?

A good deal has been said and written

62 years ago. The writer was present at the opening of the Liverpool and Manchester

Railway in 1830, and has been closely connected with railways ever since, and hundreds of times have I driven hundreds of miles at the rate of 60 miles an hour, and on other occasions as fast as I dare. I am quite certain that if they dared the

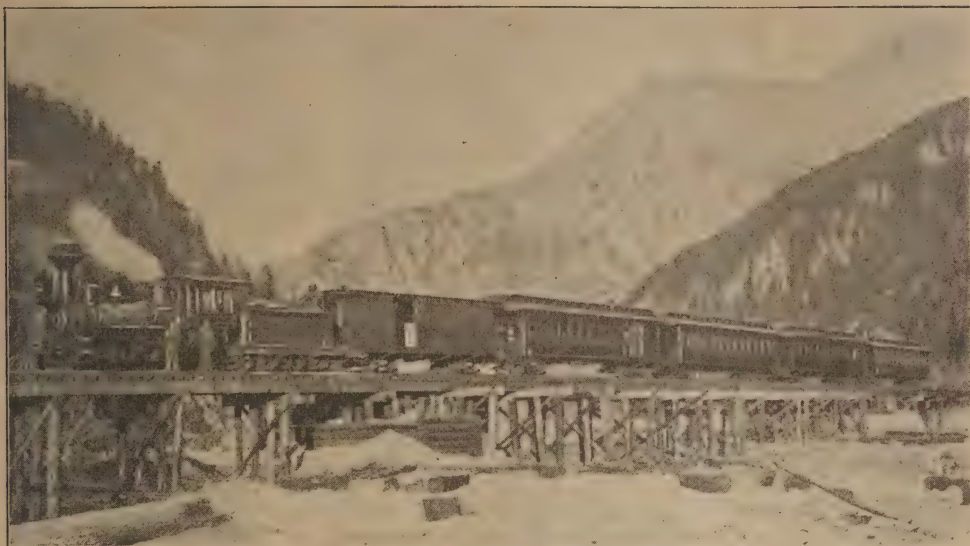
drivers on the Cheshire and London and North Western lines could run the trains much faster than they now do. If trains could be run on a single line at the rate of 90 miles an hour they could be run on the existing lines at the same speed. There are many things connected with the revival of a one-rail railway between Liverpool and Manchester proposal which would have to



A "SINGLE-RAIL" RAILWAY OF 1837

recently relative to a one-rail express railway between Liverpool and Manchester. The illustration above represents a similar one-line railway which was working

be considered. Where would the work begin? How would the roads and streets in such a city as Manchester be got over?



A TRAIN AND TRESTLE BRIDGE, WHITE PASS AND YUKON RAILWAY

THE FIRST RAILWAY IN ALASKA

By M. ARROWSMITH

SINCE the White Pass and Yukon Railway has opened up its line the dangers and hardships of travel in Alaska to Dawson and the Klondyke are fast disappearing, and the horrors of the Chilkoot and White Passes have become pages in history. From Skagway to the Summit (the International Boundary) the traveller journeys in cars as replete with every comfort as those on the Canadian Pacific, through some of the finest scenery in the world. Here let the satiated tourist wend his way, and he will be amply rewarded for three months stay in this northern clime of ever-changing lights and shades and romantic scenery.

The first sod, the forerunner of this engineering enterprise, was turned in April of last year, and the line when complete will cover over 300 miles—from Skagway to Fort Selkirk. Two trains a day are already running the 20 miles from the Port to the Summit of White Pass, and by May 15th the line will be open to Lake Bennett.

There are 17,000 men now working on the road, for the line is being built on a permanent foundation. Upwards of two and a half million dollars have already been expended on this grand piece of engineering, and no money or labour will be spared to carry its completion through as far as Dawson even, if transportation and commerce call for it. Almost by the time this article appears the

traveller and miner will be able to start from any port on the North Pacific Coast

subject seeking gold in the Atlin country can leave the railway at the junction of that



LAYING THE RAILS ALONG THE BLUFF FOR THE FIRST RAILWAY IN ALASKA

to Skagway, thence by the White Pass Railway, without change, to Lake Bennet, and there to be transferred, bag and baggage, to one of the steamers on the Lake,

name, and strike off over a first-rate trail to the diggings. The Canadian Pacific Railway, realizing what the opening up of this Alaskan territory means, have gone



THE PREMIER TRAIN UPON THE FIRST RAILWAY IN ALASKA

(SKAGWAY, JULY 21st, 1898)

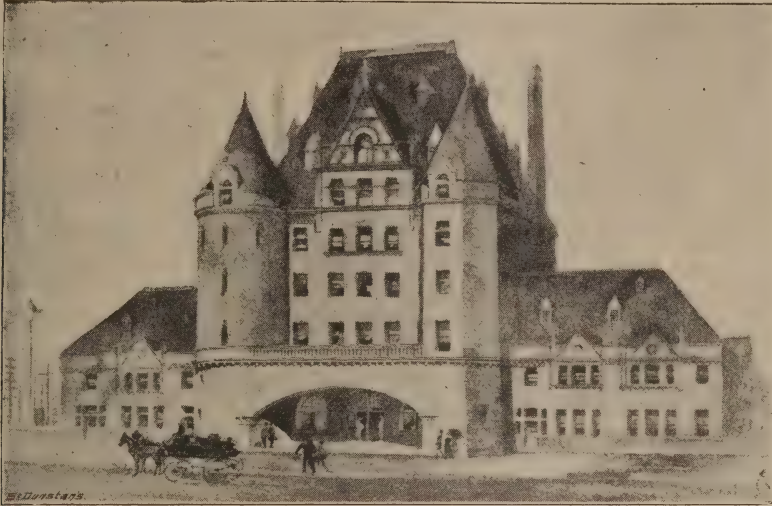
thus converting the hardships of the past into a pleasure trip. Now the British

to an expense of over 250,000 dols. in erecting a station of five stories, flanking

the waterfront, with covered passages to ships at their terminus, Vancouver; this they are rapidly pushing onward to completion, so as to be better able to handle the influx of travellers and fortune seekers

crossing the Canadian Dominion Northward bound.

The illustration below shows this new railway terminus to be one of the most imposing stations to be found in the whole world.



THE NEW CANADIAN PACIFIC RAILWAY STATION AT VANCOUVER, TO BE
OPENED MAY, 1899

THE JOURNEY'S END

I am the *finis*, let me simply state,
Though railway matters e'en must be my theme,
Impartially must I my tale relate,
Nor praise nor yet condemn each party's scheme.

I must remain a passive looker on,
My mind with pent-up genius distraught,
A BUFFER STOP for all to lean upon,
To end the journey of their trains of thought.

THE GRAND JUNCTION RAILWAY

By GILBERT J. STOKER

Late of the London and North Western Railway

OF the railways in operation at the commencement of 1836 many were for the transport of minerals only, whilst others, such as the Leicester and Swanington, condescended to allow some exceedingly uncomfortable vehicles for passengers to be attached to the tail of their trains of coal and stone wagons. This line was 16 miles long, and carried about 400 passengers per week, and is probably a favourable specimen of the extent to which the travelling public availed themselves of the accommodation afforded by such railways.

Mr. Thos. Cook, the originator of public excursion trains, relates

that he made his first railway journey between two of its stations. The Newcastle and Carlisle Railway, 64 miles long, at this time had only 17 miles completed for traffic;

the remaining portion was not ready for use until later in the year. The Liverpool and Manchester, and the group of smaller lines connected with it, formed practically

the only railways on which the passenger traffic was considered of equal importance with the goods.

Following the first proposal for a railway between Liverpool and Manchester in 1822, a scheme was got out in 1823 for one from Birkenhead to Birmingham, and another from Birmingham to London. The time was not ripe, however, for such extensive projects. The public had still to be educated as to the advantages of railways, and the teachers being almost



Photo, Beaufort]

MR. GILBERT J. STOKER

[Birmingham

Assistant District Superintendent (Retired) London and North Western Railway

as deficient in practical knowledge of the subject as those whom they tried to instruct, the process was rather slow. How dimly even the most far-seeing

of projectors realised the possibilities of the system they were recommending may be gathered from the prospectus of the proposed line from Birkenhead (Liverpool) to Birmingham issued in 1824. After expressing the hope that by means of either stationary or locomotive steam-engines, goods would be transported at the rate of eight miles, and passengers at twelve miles an hour, it proceeds, "but as no experiments have been made on a large scale, we will not pledge ourselves to this." Considering the large amount of capital required, and the unknown risk involved, these proposals did not

under the most favourable circumstances, for goods from Birmingham to Liverpool by "fly boat" was 66 to 70 hours; the average time $4\frac{1}{2}$ days, and even this ample allowance was frequently exceeded. A gentleman writes, in November 1827:—"Saw the Duke of Bridgewater's agent (at Liverpool), who says that from the quantity of grain to go into Staffordshire he cannot take any for myself or others for fourteen days. I have just sent some away that had waited for weeks." We can readily see what an effect such delays might have, in the days before free trade, through causing a scarcity, and raising



THE WARRINGTON VIADUCT, GRAND JUNCTION RAILWAY, IN 1837

offer much inducement to speculators to encourage, or to Parliament to sanction, a scheme put forward in such a timid and hesitating manner. The work of education went on, however, the perception of all classes of society being quickened by the inconvenience felt in consequence of the uncertainty and tardiness of the means of communication. This was very serious with passengers, but was perhaps felt more severely by the general public with regard to the transport of goods, which was slow and laborious to a degree hardly to be realised by the present generation. The quickest time,

the price of the most absolute necessities of life, and how far-reaching would be their influence.

Motives of humanity and mercy towards overworked and overtaxed beasts of burden were urged by powerful pens, but it is to be feared that if the introduction of railways depended upon considerations such as these, it would have remained a long time in abeyance. When, however, it was pointed out that Birmingham Canal Shares which cost £140 stood at £2,800, and that other canals were almost as prosperous, a more tender chord was touched. Men of capital saw

sweet visions of their £50 railway shares becoming equally valuable. "Why should they not," suggests a writer in the *Birmingham Chronicle*, in December 1824, "become worth £1,500?" "Why not?" echoed the man with money lying idle in the bank, or earning only a modest 5 per cent., and straightway he prepared his bill, and knocked at the door of Parliament. He was there in 1824, in 1826, and in 1830; but the men with canal shares worth twenty times their nominal value, and all the other vested interests, were too much for him, and each time

the rejection of the Reform Bill. No doubt there were reasons, but it is not easy to see why it should be supposed that two Bills could get through more readily than one, nor why one should be accepted and the other rejected; they seem to be the necessary complement of each other. If the Liverpool Bill had not been lost, by accident as it were, the Directors would have found themselves with a line ending in a field, far from any town of importance. The whole affair seems absurd, but it throws a little sidelight on the manner in which railway matters were dealt with in those days.

It was perhaps fortunate for the Company that their early efforts were not successful, because when they again applied they had a much better scheme to propose than any previously submitted. In the former Bills the line was to start from a point opposite Liverpool,



NEWTON ROAD STATION, GRAND JUNCTION RAILWAY, IN 1842
(Like all other "roadside" railway stations of the period, no platforms were provided)

succeeded in keeping the door closed.

In 1830 the directors thought that if they converted their big bill into two little ones, they might perhaps slip through. Accordingly the line was divided into two sections, with a Board of Directors for each, at Liverpool and Birmingham, and bills submitted, one for a line from Liverpool to Chorlton, near Whitmore, and another for one from Birmingham to Chorlton.

The Bill for the Birmingham section was thrown out, the other passed the first reading, but was lost owing to the dissolution of Parliament in consequence of

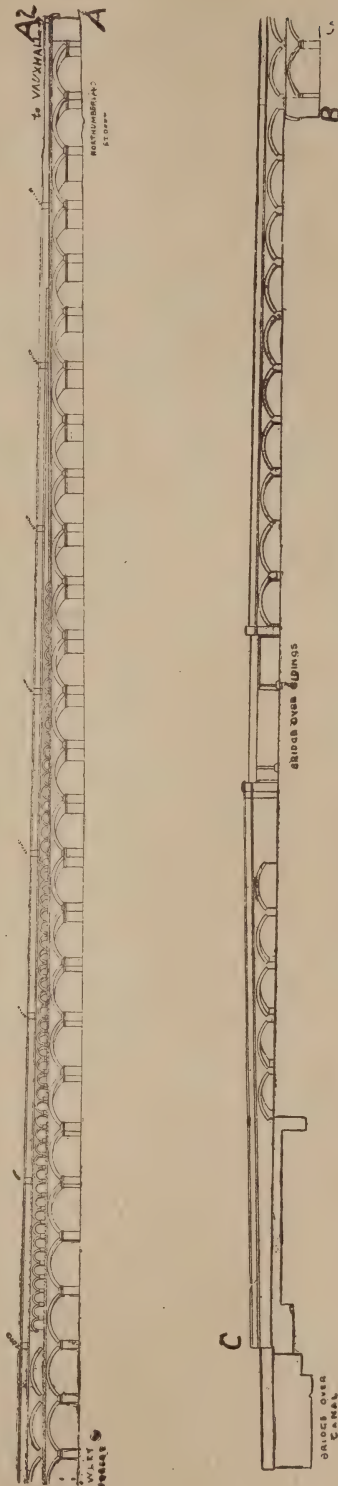
on the Cheshire side of the Mersey, a most inconvenient arrangement for Liverpool, as, of course, all traffic would have to be ferried across the river; this route was chosen to serve Chester and pick up the traffic from Wales and Ireland. Probably also the Directors were influenced by the fact that many of the stage coaches and wagons took that route. A short line, about $4\frac{1}{2}$ miles in length, had been constructed by a separate company from Warrington to Newton, where it joined the Liverpool and Manchester Railway, and at a meeting held in Liverpool on the 25th January 1832, it was proposed to abandon

the Chester route, re-unite the two former companies, and purchase this short line, and extend it to Birmingham. The advantages of this plan, by which a considerable saving would be effected in the length of line to be constructed, and the inconvenience of crossing the Mersey at Liverpool avoided, were so obvious that it at once commended itself to all concerned and was adopted. The new railway was to be called the "Grand Junction," because it was designed to join the Liverpool and Manchester, and London and Birmingham lines, and bring into direct railway communication the four greatest towns, and the most important manufacturing and trading communities in the Kingdom.

As usual elaborate figures were got out as to the traffic through the districts affected, and a dividend of 14 per cent. was confidently predicted. This estimate was higher than the experience of the Liverpool and Manchester Company warranted; their dividend had just been declared at the rate of $4\frac{1}{2}$ per cent. for the past half year. It was not, however, so wide of the mark as some we have heard of lately—in connection, say, with Cycle Companies. In 1841, 12 per cent. was paid by the Grand Junction, and from that time until the Company ceased to be a separate corporation a dividend of 10 per cent. was uniformly declared every year. At the time the meeting was held the £100 shares in the local railways stood as follows:—

Liverpool and Manchester	£205
Bolton and Leigh	£105
Warrington and Newton	£108
Stockton and Darlington	£215

It was calculated that the number of passengers by coach between Birmingham and Liverpool and Manchester was about 220,000 per annum, including through and intermediate journeys. That there was a large passenger traffic is evident from the fact that one firm alone, "P. Bretherton & Co.," advertised ten



LAWLEY STREET VIADUCT, BIRMINGHAM
From A to B shows the old Viaduct of 28 arches erected by the Grand Junction Railway, and from A2 to C the new Viaduct (over the original one) recently built by the London and North Western Railway

coaches daily from Liverpool to Birmingham and the South and West. Fares to London, 42s. inside, 21s. outside; to Birmingham, 21s. inside, 10s. 6d. outside; to Bristol, 50s. inside, 25s. outside. In a note on the Bill the public are requested to observe that "these coaches go direct

travelled 202 miles in 14 hours. Incidentally it may be mentioned that the streets were crowded with people waiting for the expresses, and on the result being announced a scene of the wildest excitement ensued. The next message arrived at Mr. Arnold's shop at 11 p.m. It is not stated



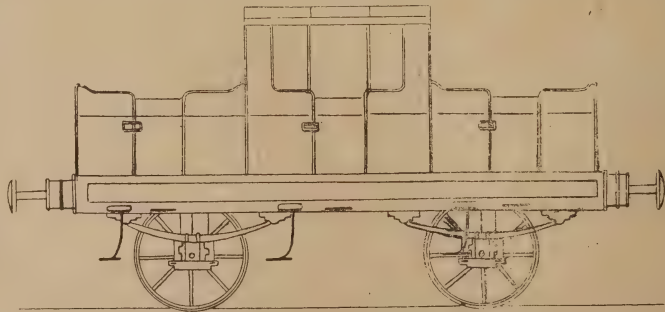
A PASSENGER TRAIN ON THE GRAND JUNCTION RAILWAY IN 1838

—the same guard and coach throughout—thus avoiding the unpleasantness of crossing the river, which unavoidably takes place in travelling *viâ* Chester."

An advertisement by another proprietor announces the "Albion" coach for London, *viâ* Chester, Whitchurch, Birmingham, Daventry, etc., performing the journey in 22 hours. A traveller leaving Liverpool by this coach, say on Monday morning at 7.45—the advertised time—would, if punctual, arrive in London at 5.45 on Tuesday morning. Passengers had the option of sleeping in Birmingham and going on next day. These coaches travelled at the rate of about nine miles an hour. A much higher speed was attained by "Express" messengers conveying important news. We probably learn the utmost that could be done in this way from what was accomplished in connection with the passing of the Reform Bill on the morning of the 14th April 1832. The news was at once dispatched by Mr. Willmer's "Express," and reached his shop in Liverpool at 10.15 on the same night, having

whether the messengers made use of any portion of the Liverpool and Manchester line, but it may, we think, be assumed that they made the journey throughout by road, *via* Chester and Birkenhead. On the same day (Saturday) Mr. W. H. Smith's express, bearing supplies of all the morning papers for his country agents, left London at 11 a.m., reached Birmingham in time for the Liverpool mail, and Mr. Arnold, newspaper agent, received his papers in Liverpool on Sunday morning. The House of Lords adjourned at 7 a.m., and the newspapers must have been printed and ready for dispatch before 11 o'clock, which, considering the appliances at that period, seems pretty expeditious work.

We may note the progress that was being made even before railways came into use, by comparing the times just mentioned with that occupied in transporting a party of soldiers a quarter of a century earlier. In December, 1806, at a time of excitement in Ireland, troops for Dublin were dispatched by canal from London to Liverpool, and it was



A FIRST AND SECOND CLASS COMPOSITE CARRIAGE,
GRAND JUNCTION RAILWAY, 1842

remarked as something special that the journey would occupy only seven days, as against 14 by road, this wonderful celerity being achieved by having relays of Irish horses in readiness at all the stations.

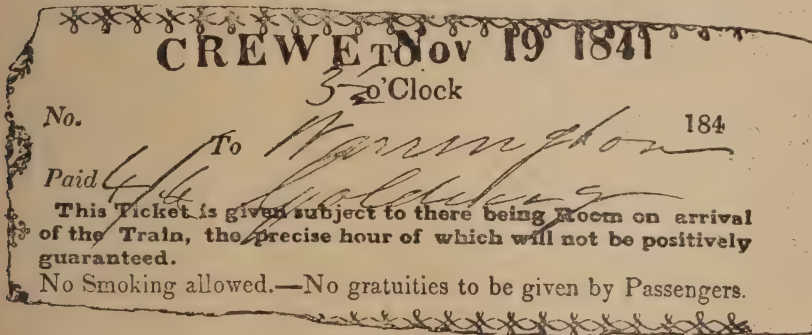
At the meeting in Liverpool already referred to, a committee composed of 12 gentlemen from Liverpool and 12 from Birmingham was appointed to manage the affairs of the Grand Junction Railway Company. Eventually the whole direction fell into the hands of the Liverpool men; either from want of interest on the part of the Birmingham representatives, or because the knowledge of railway matters possessed by the members who had been connected with the

not a single brief was delivered. This is perhaps the only instance of the kind on record in connection with a railway of such magnitude, and will explain the smallness of the expense of gaining the Act, which amounted to only £22,157. It cost the previous companies £26,225 to lose their bills.

The Grand Junction Railway was fortunate in other ways. The Warrington and Newton line, which formed just the link they wanted, was acquired on easy terms. Its share capital consisted of 518 shares of £100 each, fully paid up. On the amalgamation a corresponding number of Grand Junction shares were created, and issued to the Warrington

Company in exchange for their shares: a loan of £40,000 raised by the latter Company had also to be taken over.

The new line, which (exclusive of the Warrington and Newton) was 78



FACSIMILE OF A RAILWAY TICKET ISSUED BY THE GRAND JUNCTION RAILWAY IN 1841

Liverpool and Manchester Railway enabled them to take the lead. The necessary levels, and other particulars, were got out by Mr. Locke, under the direction of Mr. George Stephenson for the Warrington section, and by Mr. Rastick for the Birmingham portion, and an Act applied for. And "soon a wonder came to light": the Bill which had been repeatedly applied for and persistently refused during the previous 12 years, when now brought forward (with some important modifications, certainly) was passed practically without opposition, and received the Royal assent on the 6th May 1833. It is said that although as a matter of prudence counsel was retained,

miles long, passed through a country involving few engineering difficulties or expensive works. The cost of making it was only at the rate of £18,846 per mile, a remarkably low figure compared with that of other lines. In another important respect they were favoured, their contracts for iron were placed when the price was very low. Whilst the London and Birmingham Railway, about the same time, were hesitating as to the best form of rail to adopt, prices went up £4 per ton, causing an additional expense of upwards of £250,000, and their deliberations after all ended in the adoption of parallel rails of the same make as those of the Grand Junction—the only difference being that

the latter were 62 lbs. to the yard, whilst the London and Birmingham were 64 lbs.

There was but little trouble with unexpected quicksands and slippery clay, such as vexed the souls of the engineers on the sister line—at Kilsby tunnel, the London cuttings, and other places. A sort of Chat Moss on a very small scale was met with near Penkridge; to form an embankment large quantities of material were tipped daily, and disappeared during the night. The engineers were puzzled to know what became of it, until the mystery was solved by the surface of a field near the work rising into a huge mound, not unlike in shape, as one writer puts it, an enormous mushroom; it was evident the “tip” had run away by some channel and got under the field, or the pressure on the adjacent soil had caused the upheaval.

Except a very short one, scarcely longer than an ordinary bridge, near Preston Brook, the only tunnel is at Wednesfield, near Wolverhampton. It is 200 yards long, and passes underneath a canal and a public highway through good solid material, including a thin seam of coal from which the poorer inhabitants helped themselves freely whilst the excavation was being made.

The most important work on the route is the viaduct over the river Weaver near Dutton, which is 1,400 feet long, and 28 feet wide, and consists of 20 arches, each 63 feet span, and 65 feet in height above the level of the water. The completion of the bridge was made an occasion of great rejoicing. The last keystone was laid by Mr. Heyworth in the presence of a party of his fellow Directors, the Chief Engineer and other officers, and the workmen. Mr. Heyworth congratulated those connected with the work on the fact that in the two years during which it was in progress, there was no accident causing loss of life or limb; in the evening a grand display of fireworks terminated the proceedings.

Vale Royal Viaduct is a somewhat ex-

tensive work, notable for an *unfulfilled* prediction “that when the rocks near Warrington should visit Vale Royal the sun of the Cholmondeley family would set.” The stone of which the viaduct is built came from the High Cliff quarry near Warrington, which caused the good people on the neighbouring estate of Lord Delamere, who is of the Cholmondeley family, very ominous thoughts; when what appeared to be the fulfilment of the first part of the prophecy took place, wiseacres shook their heads.

“But what gave rise to no little surprise, Nobody seemed one penny the worse!”

The heaviest earthworks in cuttings and embankments are probably near Madeley on the borders of Staffordshire and Cheshire, where there is a long incline rising almost from Crewe to Whitmore, in the course of which, between Basford and Madeley, occurs the steepest gradient on the line; in a distance of about six miles it varies from 1 in 260 to 1 in 180. This would not be considered very formidable for one of Mr. Webb’s big engines, but it was evidently with a sense of relief that the Directors mentioned in their report, soon after the opening of the line, that “the engines can surmount Madeley summit, with a train of more than 200 passengers, and their luggage (a load far exceeding the average), without any material diminution of speed.” Even now drivers tell you that “Madeley Bank” is a “stiff bit of road.” On reaching the summit near Whitmore, 390 feet above the level of the sea, the line is flat for about half a mile, and then falls with a comparatively easy descent until within about three miles of Stafford. The highest elevation on the line, 440 feet above sea level, is attained at Wednesfield, near Wolverhampton.

With the view of mitigating the effect of an engine or vehicle running off the rails on high embankments, a small bank or ledge of earth about a foot high was

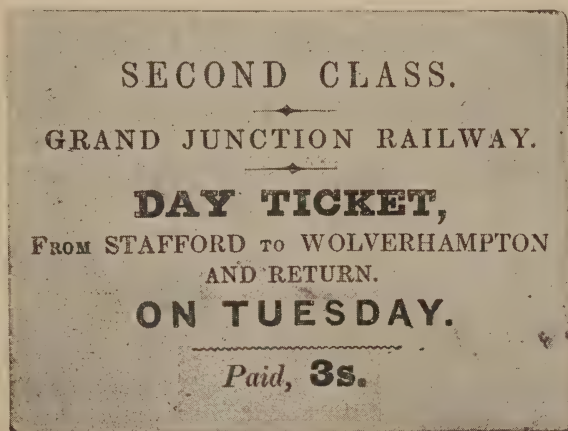
run along the edge at each side, in which it was expected the wheels would become embedded instead of going over and down the bank. Between Penkridge and Spread Eagle (or Gailey as the station is now called) an ingenious use was made of the spare material taken from the cuttings. The railway runs for about three quarters of a mile alongside the high road, and the *spoil* was so disposed between the rail and the road as to form a screen to prevent horses being frightened by the engines.

According to the original plans the stations for the lines from London and Liverpool were to be in Broad Street, Birmingham; subsequently, to avoid the heavy work and tunnels this would entail, it was arranged to erect them at Curzon Street, where the ground was on a lower level and the approaches much easier. To get to Curzon Street from Vauxhall, the valley of the Reay had to be spanned by what is called the Lawley Street Viaduct. At the time this was considered a very magnificent structure, and no doubt it looked striking and imposing before the graceful curve formed by its twenty-eight massive arches was hidden from view by buildings.

A few years ago, when the line was widened, another viaduct was erected on the top of the original one, which bears the superincumbent weight with perfect safety, from which we may conclude that the "jerry builder" had no hand in its construction. With the happy knack railwaymen have of applying descriptive epithets, the new work, which rises very sharply at one end to descend as rapidly at the other, has been dubbed the "switchback." The illustrations show the viaduct as it was sixty years ago, and as it appears now.

The Grand Junction directors were more mindful of the comfort of their passengers than other early companies: their car-

riages were far in advance of those of the Liverpool and Manchester, and were much superior to corresponding vehicles at first placed on most of the lines opened later, which it might be supposed would have profited by their example. Even the second-class carriages, the lowest-priced at the time, were covered in and closed at the sides, and some pains were taken to give all the coaches a handsome appearance outside. The train shown in the illustration is really rather picturesque, and compares favourably with trains of the present day, made up of cubes on wheels, the exterior decorated by artists



A RETURN TICKET ISSUED BY THE GRAND JUNCTION RAILWAY IN 1842

who would apparently have us believe that the line of beauty is—*straight*.

By an Act passed in 1837 a company was incorporated to construct a railway from Manchester to Birmingham through the Potteries, but opposition and lack of support caused the scheme to be curtailed, and a shorter line was made, to join the Grand Junction at Crewe. A through carriage of a rather peculiar pattern was run once a day from Manchester to Liverpool *via* Crewe. In the middle was a covered compartment for those who were willing to pay for the luxury, and at each end an open compartment, unprotected from wind or weather, for

more economical passengers. The sketch gives a good idea of the appearance of this primitive "composite."

Before proceeding to the opening of the new line we will notice an opposition scheme started in 1833. In that year a prospectus was issued for making a granite road from London to Birmingham, and from Birmingham to Holyhead and Liverpool. The name of the company was to be "The London, Holyhead, and Liverpool Steam Coach and Road Company," the capital £350,000, in £20 shares. Consulting engineer, Thomas Telford, President of the Institute of Civil Engineers; acting engineer, John MacNeil.

The line was to consist of two rows of pavement, composed of stones six or eight feet long and one or two feet square, laid endways along each side of the road. This would form a track along which, whether hilly or level, it was anticipated engines would easily travel at the rate of 20 miles an hour, including stoppages. "The road being on a level with the long stones the carriages could easily quit the stones for any momentary necessity." For repairs it would only be necessary to turn the blocks over, so as to present a new side to the surface, and after another lapse of time do the same, until all the four sides were worn in their turn. After this the "parallelopipedons" might be submitted to the mason's chisel. The rate of speed was "to be limited only by due regard to the safety of the passengers."

If the scheme had been put forward by an inexperienced amateur, it might be excused on the ground of want of knowledge, but that it should be supported by engineers of such eminence as Telford and MacNeil is very surprising. The practice of laying down stone wheel tracks was not new; roads laid in this manner had been in use for ages; what we find difficult to understand is that their obvious unsuitability for being worked by steam power, under the conditions described, were not at once perceived by practical men such

as these. The reason perhaps is not far to seek, both were famous road-makers, and it was another exemplification of the old adage, "there is nothing like leather." In connection with this proposal a sort of trial trip to show what could be done by road carriages was made in Col. Dance's steam coach on the 1st November 1833. It was intended to proceed from London to Birmingham, but the engine was found not to be powerful enough for the load, and only got as far as Stony Stratford. The engine, with the coach and passengers, weighed six tons, average rate of travelling seven and a half miles an hour. Telford and MacNeil were of the party, and a report of the proceedings was signed by them.

As the Lawley Street Viaduct was still incomplete when the other portions of the Grand Junction Railway were finished, a temporary station was erected at Duddeston close to some public gardens called Vauxhall, after the famous grounds in London, and by this name it was generally known; this was the first station erected in Birmingham; it was here the first railway trains were seen in the town.

The line was opened on Thursday, July 4th, 1837. No official notice was taken of the event by the public authorities or the directors. Even the local newspapers had but slight references to it. We are indebted to a London paper for particulars. The account brings the scene so vividly before us that it is worth transcribing.

"Birmingham, Wednesday, July 5, 1837.

"At an early hour the town was in a state of great commotion and pleasurable excitement, owing to its being the day appointed for the general opening of the Grand Junction Railway from Birmingham to Liverpool and Manchester. Soon after five o'clock the streets leading in the direction of Vauxhall, where the Company's temporary station is situated, were crowded with persons of all ranks anxious to witness the first public travelling on this important line of railway communication.

"It was remarked, however, as somewhat singular, that there was, even throughout the day, a compara-

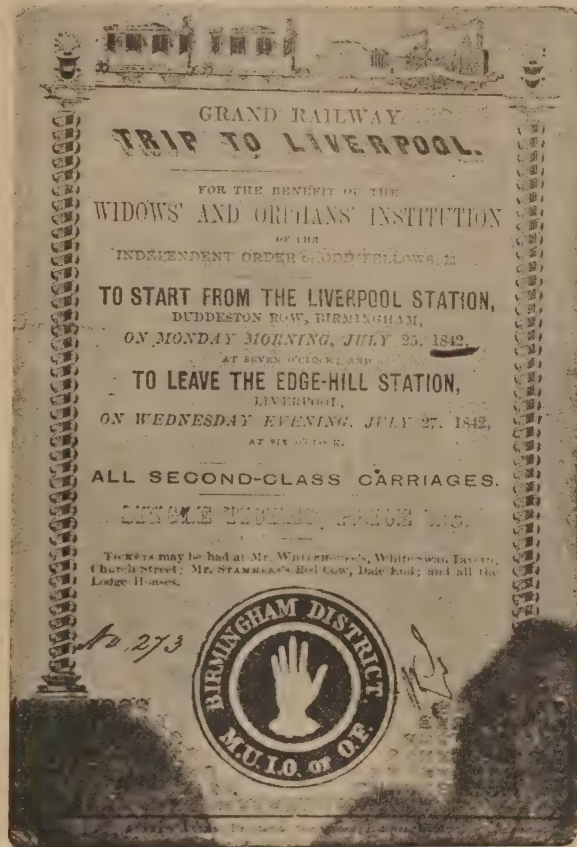
tively small attendance of the leading merchants and manufacturers of Birmingham, which has been attributed to none of the latter having been placed on the direction of the Grand Junction Railway. Indeed the Directors of the latter are entirely limited to the bankers and merchants of Liverpool.*

"By six o'clock yesterday morning the bridge which crosses the railway at its entrance to the station yard, and indeed every eminence that commanded the least view of the line, was covered with person awaiting the starting of the carriages. But it was not in Birmingham, or its immediate vicinity only, that public curiosity was unusually excited. The embankment of the several excavations, and even the valley through which the railway alternately 'wends its way' between Birmingham and Wolverhampton, were literally covered with dense masses of admiring spectators. Indeed, in the neighbourhood of Bescot Bridge, James' Bridge, and Willenhale, contiguous to the iron and coal district, the crowd was, if possible, more formidable than in the suburbs of Birmingham.

"Upon entering the station yard about half-past six o'clock, we were, however, much struck with the thinness of the company within the Company's premises. It presented a striking contrast to the station yard on Olive Mount, at the opening of the Liverpool and Manchester Railway in 1830. It was evident, indeed, that no exertions had been made to give *éclat* to the proceedings of the day; there were no bands of music, no profuse display of banners, no attendance of distinguished visitors—in fact, within the precincts of the station there was scarcely anything to distinguish it from an ordinary day of business. The only display we observed was a small flag attached to the first carriage of the train, on which was emblazoned in small characters, with the Royal Arms, the letters 'W. R.,' 'A. R.,' and the words, 'The True Reformer.'

At seven o'clock precisely the bell rang, when the opening train, preceded by the Wildfire engine, commenced moving. The train consisted of eight carriages, all of the first class, and bearing the following names: The Triumph, the Grey-

hound, the Swallow, the Liverpool and Birmingham Mail, the Celerity, the Umpire, the Statesman, and the Birmingham and Manchester Mail. The train started slowly, but upon emerging from the yard speedily burst off at a rapid pace. To those who for the first time witnessed such a scene it was peculiarly exciting, and the immense multitude, as far as the eye could reach, gave expression to their admiration by loud and long-continued huzzas, and the waving of



AN EXCURSION TICKET, GRAND JUNCTION RAILWAY, 1842

hats and handkerchiefs. Having in some degree escaped the multitudes, power was laid on, and from Perry Barr to Newton Road the speed could not be less than from 35 to 40 miles in the hour.

"The succession of trains which followed throughout the day served to keep up the popular excitement, and the crowd, instead of diminishing in number, hourly increased. At half-past eight o'clock a train of the second class set out amidst similar demonstrations of admiration to those called forth by the first. The chief object of attraction which now engaged the public attention was the arrival of the first train from

* The Directors attributed their omission to arrange for any opening ceremony to their respect for the memory of Mr. Huskisson, who was accidentally killed at the opening of the Liverpool and Manchester Line. Seeing the accident happened seven years before on a different line, and nearly a hundred miles from Birmingham, the reason seems rather far-fetched.

Liverpool. The Directors, in their published statement of arrivals and departures, announced that this train would leave Liverpool at half-past six in the morning, and arrive at Birmingham at five minutes past eleven—that is in four hours and a half. It was to be expected, however, that owing to the crowds which would assemble at the various stopping places, some interruptions would occur, and the arrival of the train at Birmingham be delayed beyond the appointed hour. In this respect the general expectation was in a small degree eventually confirmed. At about twenty-seven minutes past eleven the cheering at a distance announced the approach of an arrival, and at exactly half-past eleven o'clock the first train from Liverpool entered the station yard in Birmingham amidst the most vociferous applause. It was difficult to say which party appeared the most delighted—the astounded travellers, or the multitudinous wonder-struck company by whom they were received. Throughout the entire journey the opening train from Liverpool experienced the most uninterrupted enjoyment of 'wind and weather.' It consisted of the Hibernia, the Chanticleer, the Patriot, the Delight, the Delamere, the Columbus, and the Birmingham and Manchester Mail. The train left the stations at Manchester and Liverpool at half-past six. . . . Including stoppages, the train performed the journey at the rate of at least 20 miles per hour; being, as might be expected, about half an hour late on account of interruptions incidental to the day.

"The starting of the several trains which followed from Birmingham was remarkably regular, but owing to causes to which we have already alluded, the arrival of those from Liverpool was not equally well-timed. The mixed train which ought to have arrived at two o'clock did not arrive until four. This delay was attributed chiefly to the obstreperous intrusion of the workpeople in the iron and coal districts. From Wolverhampton to James' Bridge, the carriages were literally besieged by the multitude, and the only way to avoid accident was to proceed slowly and surely, without regard to the published time of arrival in Birmingham. The first return train from Liverpool arrived at seven o'clock, and was loudly cheered upon its entrance into the station yard.

"So far the proceedings of the day passed off joyfully and without any mixture of alloy, but the non-arrival of the mixed train, which ought to have come in at ten o'clock, very soon gave rise to very considerable apprehension. The last first class return train was advertised to arrive in Birmingham at five minutes past eleven, but the hours passed away, and midnight succeeded, and still no tidings of it had been received. At three in the morning, however, both trains arrived, the delay having been occasioned by the breakage of one of the tubes of the engine by which the mixed train was worked."

The first train from Birmingham, 7 a.m., which was due in Liverpool at 11.30, did not arrive there until nearly 1 o'clock. Some delay was caused through the train having to stop for the luggage to be removed from the roof of several of the coaches and placed on others, in consequence of the weakness of the springs allowing the carriages to bump against the axles. A portion of the bottoms of some of the carriages was completely worn away by the friction.

A writer, who travelled from Birmingham to Wolverhampton in October 1837, describing the operation of booking, says:

"I entered a moderate-sized room, shabbily fitted up with a few shelves and a deal counter, like a shop. Upon this counter, spread out, were a number of large open books, the pages of each being of different colour to the others. Each page contained a number of printed forms, with blank spaces to be filled up in writing. On applying to the clerk in attendance, I had to give my name and address, which he wrote in two places on the blue page of one of the books; he then took the money, tore out a ticket, some 4 inches by 3, and left a counterpart in the book. I was then shown to my seat in the train, and on inspecting, at my leisure, the document I was favoured with, I found that in consideration of a sum of money therein mentioned, and in consideration, further, of my having impliedly undertaken to comply with certain rules and regulations, the Company granted me a pass in a first-class carriage to Wolverhampton."

The railway had not at this time, three months after its opening, driven all the other conveyances off the road, for he mentions that he returned from Wolverhampton in the evening on the omnibus.

One of our illustrations is a *fac simile* of a Grand Junction Railway "paper" ticket issued in 1841; this does not contain so many details as those described by our friend in 1837, and the amount of writing was still further reduced by the use of a stamp for the name of the station and date of issue. The stamp was evidently introduced after the tickets were printed, as it does not fit into any space left for it. A further advance in sim-

plicity is apparent in the copies we give of two tickets issued in 1842, taken from the originals in the possession of the writer of this article.

The first is an ordinary return ticket; it is not numbered, and has no date except the day of the week. The date appears to have been omitted from motives of economy, in order that the tickets might after they were collected and checked be returned to the stations from which they were issued, and used again on the corresponding day in the following week. It will also be observed that the fare is printed at foot. The practice of showing the fare on the ticket gradually fell into disuse, and was only recently revived after an interval of many years, by Act of Parliament. A very troublesome Act it is to the companies, and a cause of considerable expense. A slight alteration of fares may make it necessary to reprint many thousands of tickets, and printing these, and withdrawing the existing stock, involves an amount of labour only to be realised by those who have to carry out the work. It was understood that the object of the regulation was to protect the public against rapacious booking clerks, and no doubt the system is useful in this respect. Many clerks express a wish that something could be introduced to work the other way, and protect them against the public. It is singular, and not very flattering to human nature, how readily the majority of passengers will detect an error against themselves, and how slow they are to perceive one made in their favour. Possibly railways share the depravity said by some cynical humorists to be inherent in umbrellas and horses, which tends to weaken the moral sense in certain people, otherwise of the most unimpeachable integrity.

The excursion ticket is extremely interesting. It is generally understood that the first publicly advertised excursion was run at the instance of Mr. Thos. Cook, on the 5th July, 1841. The idea must

have "caught on" pretty quickly, as we have here, only twelve months later, an important excursion, evidently, as much in the ordinary course as any of the thousand and one trips advertised during the season at the present time.

Soon after the opening of the line a singular difficulty arose. The Grand Junction Company wished to arrange trains at certain hours on Sunday, but this was objected to by the Liverpool and Manchester Company, which had a by-law prohibiting the running of trains over their line between 10 o'clock in the morning and 4 o'clock in the afternoon on that day. It so happened that the trains interfered with the mails, and on being appealed to, the Secretary of the Post Office put his foot down, and "declined being a party to an arrangement (for the suspension of any of the trains on that day) that will so vitally affect the public interest." Although it may as in this instance sometimes be carried too far, the Liverpool and Manchester Directors were actuated by a sound principle, and it is to the honour of the great company by which they were succeeded that it has, whilst affording all necessary accommodation for the ordinary requirements of the public, adhered to the same lines thus preserving as far as possible the inestimable boon of Sunday rest to its staff, and setting an example which has had a salutary and far-reaching effect.

The Grand Junction Railway never made any great display in the world; it passed very quietly through Parliament, the work of construction was carried on so silently that one writer says it seemed to have been forgotten for three years, and on completion it was opened without any display or formality. Subsequently it went on in the same unobtrusive manner, subscribing additional capital to schemes that seemed for its advantage, such as £250,000 towards the Lancaster and Carlisle Railway, and absorbing little lines here and

there in its vicinity. At the beginning it amalgamated with the Warrington and Newton Line, and subsequently, in 1840, the Chester and Crewe, and in 1845 the Bolton and Leigh, the Liverpool and Manchester, and the Kenyon and Leigh. Meanwhile its bigger neighbour, the London and Birmingham, with much flourish of trumpets, was progressing rapidly, and by construction, and amalgamation, and leasing, was enlarging its territory, and increasing its capital, until at length occurred what was foreseen from the first to be inevitable. On the 16th July, 1846, a grand amalgamation took place. By Act of Parliament, 9 & 10 Vict., c. 204, the London and Birmingham, the Grand Junction (of which the Liverpool and Manchester already formed a part), and the Manchester and Birmingham were united into one great Company, henceforth to be known as the

"London and North Western Railway." The capital of the new company was declared by the Act to be £17,242,310, contributed as under by the respective companies:—London and Birmingham, £8,653,750; Grand Junction, £5,788,560; Manchester and Birmingham, £2,800,000.

How the London and North Western has been built up, step by step, since its incorporation, fifty-two years ago, until it has become the greatest railway company in the kingdom, it is unnecessary to enter upon here. Although ours is but a sober, common-place history, we will take example from the novelists, who usually conclude when their most interesting characters change their names. Having brought the Grand Junction Railway to the point where it starts afresh, under a new title, we will follow its fortunes no further for the present



THE TRIUMPH OF THE RAILWAY OVER THE MAIL COACH

(From an old Print)

IS THE "SINGLE" LOCOMOTIVE DOOMED?

BY GEO. SKIPTON EYLOT

Illustrated by Outline Sketches Drawn by the Writer



THE rolling years bear a certain resemblance to the rolling locomotives. Some huge monster issues from the shops of Crewe or Swindon, armed with a four-figure number, and after running a few thousand miles is ornamented with a name. So is it with the years, as "Time, like an ever-rolling stream, bears all its sons away," to quote the old hymn—they come to us nameless; they leave us named. I strained my eyes at midnight on Saturday, Dec. 31st, to see the name which decorated the splasher of No. 1898, as, uncoupled from our train, she puffed off to the running-shed. I think it was "Khartoum," though, on the other side of the Atlantic, it might have been read "Cuba." No. 1899, who is getting up her speed as I write, making the dark telegraph-posts whisk quicker and quicker past the window, is as yet nameless, and never having travelled this way before, we know not the scenery through which she will drag us, nor the banks we may have to surmount their grades or their curves; for, alas! steep grades and sharp curves consort together, and combine to retard us as we roll. It is strange that our time-engines are all wrongly numbered. Had not Dionysius, who, by bringing out his Aera, introduced those well-known letters "A.D." to the world, letters which have been stolen from their original signification, "Aera Dionysii," and given to the more telling "Anno Domini"—had not this monk, I say, in the sixth century, made a little mistake, and placed our Saviour's birth in the Roman year 754, instead of where it undoubtedly ought to

have been placed—749, or a year or two earlier—had he not made this mistake, 1899 would be numbered 1904 or 1905, and we should realise that we are already rolling along in the twentieth century, and have been so for some years. Many of us are wondering what the influence of 1899 will be on the express passenger locomotive of the future. The Midland and Barry are introducing some goods engines of American build—the first which have been imported for our normal gauge since Baldwin's bogie-engines came to work the Lickey incline on the Birmingham and Gloucester sixty years ago, and No. 990 on the Great Northern, though anything but American in build, has been, in regard to general arrangement, seen on one or two American lines for some time past.

It is very remarkable how gently Time has treated the English express locomotive. Very early in the history of English railways, the inside-cylinder-single-driving-wheel-heavy-outside-girder-frame engine (see Figs. I. II. III.) became the usual type for passenger traffic. For brevity's sake I may, perhaps, call this the "Planet" type, or, to take a later example, the "North Star" type. In the sixties this type of engine was doing almost all the fast passenger work on the Great Western, both broad and narrow, the South Eastern, the Brighton, the Great Northern, the Midland, and the North Eastern. A few, too, of the larger of Mr. Connell's engines on the North Western were of this type, the greater number being of the "Jenny Lind" type, having inside bearings only—a type which has been revived in the 7ft. 6in. singles of the Great Northern Railway. Some of the Brighton, notably No. 147,

which for some time worked the 8.45 a.m. Brighton to London express, and of which

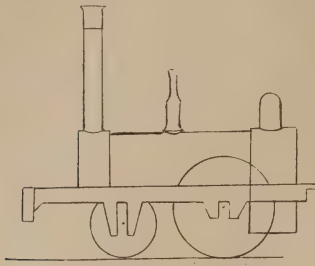


FIG. 1.—“Planet” Type of 1834

I heard Mr. Craven say, in 1866, that it was the best engine he had built, had also, as regards their driving wheels, inside bearings only; but by the middle of the sixties the “Planet” type were running most of their fast trains. As to the other Companies, the Great Eastern and the South Western were running with the “Allan” type of single engine, outside cylinders, and inside framing, though the London and South Western Railway, very early in the sixties, began to couple all their new engines. They had indulged in some lofty wheels in their single engines “St. George” and “Britannia” (not to be confounded with the coupled engines afterwards so named), “Volcano” and “Vesuvius,” though my memory will insist on drawing these last two with inside cylinders, were among the most conspicuous. The South Western Railway had at least two of the “North Star” type of single

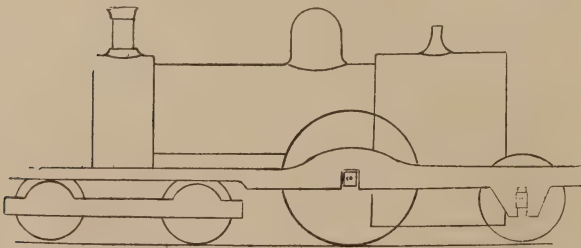


FIG. 2.—The “Planet” Type—the evolution of 60 years. Great Western Express, 1891-99

engine—“Marmion” and “Rufus.” On the North Western, the “Allan” type,

which had ruled on the Chester and Holyhead, competed for supremacy with the inside cylinder “Bloomers,” or “McConnells,” and was strengthened in the early sixties by the building of 60 “Lady of the Lakes.” On the whole, however, we may fairly say that the “North Star” type prevailed in the early sixties on the English railway. Fig. 3 shows to what dimensions it had reached on the narrow gauge railways, though this South Eastern Railway engine is probably a large specimen for her time, and has a specially large firebox. At this date the narrow gauge “North Star” type of engine weighed from 28 to 32 tons, had 6 ft. 6 in. or 7 ft. drivers (some of the London and North Western Railway had 7 ft. 6 in.) usually about 1,000 ft. of heating

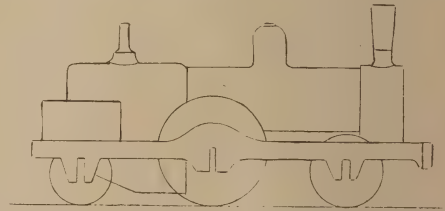


FIG. 3.—Sketch of a South-Eastern Railway “Single” Express Engine in the Sixties developed from the “Planet” type

surface, and cylinders about 22 in. by 16 in. The narrow gauge were in the sixties still considerably behind Gooch’s 8 ft. singles on the broad gauge in size and power.

Towards the close of the sixties a vigorous attack was made on the single express engine, the four-coupled engine came with a rush, and eventually, save on the Great Northern and the Great Western, captured the position. The Great Northern had built four-coupled express engines as early as 1855, but were still wavering and in ’66 ’67, one as often as not travelled from Peterborough to London behind a four-coupled engine. The attack had been made about the same time on the Great Western—thirteen large four-coupled engines with 7 ft. drivers, then

and till 1862 the only examples of the coupling of wheels so large in England, had appeared and contested the rails with the 8 ft. singles. In the sixties, however, when the Great Western began building express engines for their narrow gauge traffic, the old orthodox "North Star" was adopted and retained, curvilinear framing and all. The Great Northern parried the attack with Stirling's 8 ft. singles of the Allan type. The narrow gauge had previously reached an 8 ft. wheel in Crampton's engine on the London and North Western, and 8 ft. 6 in. in Trevithick's, "Cornwall," on the same line, but these engines of Stirling's came to stay, and have stayed so far for 28 years, and are only now threatened by No. 990 and a four-coupled Lancashire and Yorkshire engine which has been trying its paces on the Great Northern lately. The other great railways all fell before the advance of the four-coupled. The single express engines seemed to be doing good work. On the Great Northern they often made Peterborough, 76 miles, in about 90 minutes; on the Brighton they ran their 50 miles in 58 to 62 minutes; the North Eastern made good runs between York and Newcastle; and the Midland, in darker green, bustled about from Leeds to Bedford and on to Hitchin and up the crowded Great Northern lines to King's Cross, but increasing traffic and the advent of larger and much heavier coaches with far more dead weight per passenger, were driving the locomotive superintendents to couple their wheels, and at one time we all thought that by the nineties the single express engine would be as extinct as the Dodo.

As I have said, the South Western began coupling two pairs of wheels of their passenger engines about 1862. I doubt very much whether they built a single-driver engine in the sixties, and by 1870 there was not one to be seen on their main routes. Other lines were later, but all the same the general tendency was to-

wards the coupled engine. The Brighton built few single engines, some 20 perhaps, after the "Grosvenor" in 1874. The South Eastern built few, if any, but their 7 ft. singles were still working some of the fast traffic in the early eighties. The North Western seemed by this time to be building nothing but great four-coupled engines, and the Great Eastern, though like the Manchester, Sheffield and Lincoln, they indulged in some few imitations of Stirling's 8 ft. singles, had settled down by 1883 to the four-coupled pattern. So had the North Eastern.

As to the particular pattern of which I chiefly speak, the "North Star" pattern, I doubt much whether between the early sixties and the early eighties they were built by any Company save by the Great Western, unless some were built on the Bristol and Exeter. At Swindon the old pattern was maintained both for broad and narrow, and the old 8 ft. singles were rebuilt or renewed almost exactly on their original lines. This extreme conservative action on the part of the Great Western Railway may have been partly due to the failure of Brunel's early experiments in deviation from orthodox patterns, but must have been chiefly due to the economy in working and general success of the famous Broad Gauge 8 ft. singles. Whatever may be its cause, however, it is very remarkable that the Great Western Railway alone of all great railways has maintained for its express traffic between London and Exeter the same type of engine from 1838 to 1898, and will probably maintain the same for another twenty years, though the four-coupled "Barringtons" are just now attacking the position vigorously. It is all the more remarkable because, while the Great Western Railway have maintained it, the North Western, their great rivals in mileage, have, at all events since their very early days, scarcely ever employed this "North Star" type. I fancy also that the example of the Great Western and its

early reputation for speed had its influence on the locomotives of other rail-

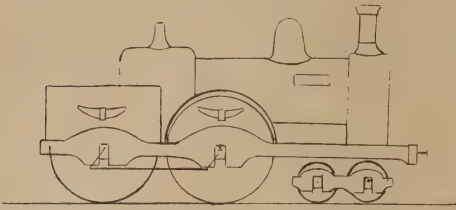


FIG. 4.—Sketch from memory of a London, Chatham & Dover Railway 4-Coupled Express of nearly forty years ago

ways. It is not surprising that the Bristol and Exeter Railway built palpable imitations of the 8 ft. singles, nor is it surprising that Mr. Sturrock's 7 ft. singles in the sixties on the Great Northern Railway had a certain resemblance in general design to the Gooch's 8 ft. singles, and the North Eastern, the South Eastern and the Brighton, though they all were embellished with domes, which the Great Northern lacked, were practically of the same design. Their likeness to Gooch's singles arose, however, from their having a common ancestry, but nevertheless the success of the Broad Gauge 8 ft. singles must have had its weight, must have contributed to the adoption on other railways of the "North Star" rather than the Allan type, as it undoubtedly contributed to its maintenance on the Great Western Railway itself. Not without reason has the "North Star" been considered the parent of the Great Western express engine. The first narrow gauge express engines which the Great Western Railway built were mini-

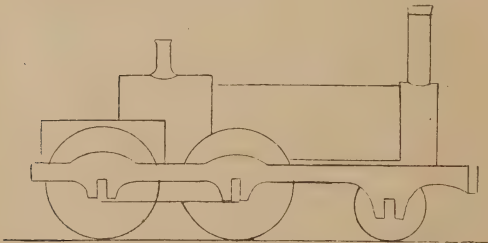


FIG. 5.—Great Northern 4-Coupled Express of 1855

ature "Great Britains," some of which have since been "domed," and some, I

believe, coupled. The next pattern, built about 1864, had flush boilers but maintained the old curvilinear frame. The 1868 pattern added the dome and simplified the frame, the 1876 pattern dropped the dome again. Nos. 9 and 10, built in the eighties, had a history of their own, which I omit, but the 1891-1898 pattern have returned to the dome and the raised firebox, and have, under compunction, added a bogie truck. Dome or no dome, raised fire box or flush boiler, the "North Star" type has been maintained all through. So consistently has this type been maintained on the Great Western Railway that if you put a dome on the "North Star" of 1838 and a bogie truck, you would have, on a smaller scale of course, one of Dean's monsters of 1891 to 1898.

The Midland had begun to couple their

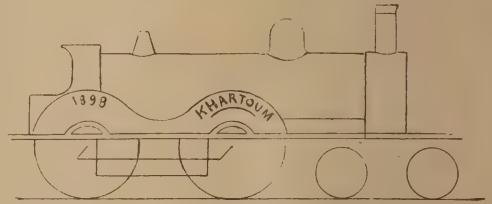


FIG. 6.—Present day type of 4-Coupled Express—the evolution of the Great Northern Railway 4-Coupled type of 1855

drivers in the later sixties, and by 1880 it was said that of their once numerous stud of single express engines they had but one remaining. About 1887, however, they commenced once more to build single engines, tentatively at first, with 7 ft. 3 in. wheels, which have now reached 7 ft. 9 in. Their example has been followed by the Great Eastern. On this latter line a few 7 ft. single engines of the "Jenny Lind" type have been running since 1887, but last year saw the advent of a few of the "North Star" type, their wheels cautiously confined as yet to 7 ft. The position of the "North Star" type has thus been greatly strengthened of late years, and it has taken a long lease of life in the building of Dean's eighty monsters. Nevertheless there are no signs as yet that

it is to be the English engine of the future.

You have only to run your eye through a Locomotive Album to perceive that England is held at present by the four-coupled inside-cylinder — and usually

What is to come next? A few years ago I should have said the compound engine. The compound, whether with four, three, or two cylinders, seemed to be establishing itself on the London and North Western and the North Eastern,

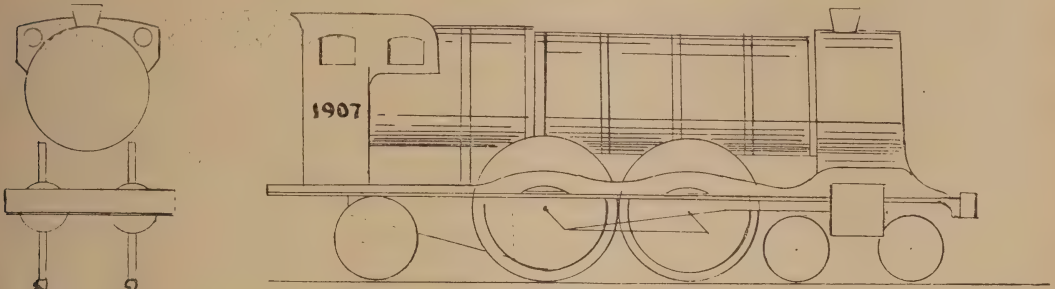


FIG. 7.—"By contenting ourselves with a boiler 6-ft. in diameter, we shall be able to have 6-ft. 6-in. wheels"

inside-frame--bogie engine (Figs. V. and VI.), the North Eastern variety of which, with its 90 inch wheels, rivals the ambition of the single engines.

Racking my memory as I look back, it seems to me that the first inside-cylinder four-coupled bogie express that I ever saw was in the sixties, on the Chatham and Dover This Company, as far as I know, have never used single-driver engines; their heavy grades of 1 in 110, and heavy graded approaches to the Grosvenor Bridge, had at all events driven them very early to coupled wheels, and Fig. IV. is a rough sketch from memory of a heavy, clumsy-looking fellow that I have seen in the 'sixties at Longhedge. In the early days of the "Bogie" in England, its wheel base was much shorter than is now the rule, and the truck wheels of this specimen were also very small. On the Stockton and Darlington the early four-coupled bogie express engines had outside cylinders.

Just as there were signs in the Sixties that the reign of the "North Star" type was coming to an end, so there are signs now that the reign of the four-coupled bogie express, as far as its more usual types are concerned, is threatened.

and we were told that it was saving some 15% of fuel, and the huge "Greater Britain" threatened to be the engine of the future. Things have changed since then, the compound lingers on the London and North Western, but on that alone. It has not, apparently, come yet to stay in England; it may, however, do so presently, with the advent of larger boilers. It seems to be leaving us nothing but its high-pressure; the 120 lbs. pressure of the sixties has risen to 160, to 170, to 200, with marked economy of working. Are we to move therefore in the direction of No. 990 on the Great Northern Railway — an engine which seems to be waiting for the arrival of larger turn-tables before he can disport himself happily upon the rails? Fig. VII. sketches what we might do in this direction. Or are we to couple six wheels together of some 6 ft. 6 in. diameter with a bogie in front, and run a ten wheel express engine of 60 tons weight with 15 tons on each of the three pairs of driving wheels?

The "Dunalastair" has undoubtedly with her success both in speed and haulage set a fashion which will not quickly die, a fashion for large diameter boilers, and therefore necessarily somewhat smaller wheels than have ruled of late. I

say necessarily, because our loading gauge limits us in height as well as breadth. We cannot do as the Americans are doing, put a huge boiler and firebox over the top of a 7 ft. wheel. Our chimney tops are limited to some 13 ft. above the rails, our boiler tops to 11 or 12. We shall not come quickly if we ever come at all to the monstrosities I have sketched in Figs. VII. VIII. IX., but we shall come in a few years to engines with boilers from 5 to 6 ft. in diameter, and wheels, either four-coupled or six-coupled, of 5 ft. 8 in. to 6 ft. 3 in., propelled by outside cylinders 28 by 24. Such engines will draw their three or four hundred tons at some fifty miles per hour up and down hill, trains composed of from ten to a dozen great thirty-ton cars will meekly follow them along the rails. The "single-driver" engine, which many of us love so much, will die out, as "single-driver" tank engines have died long since. Our grandchildren will scarce have heard of a locomotive without a coupling-rod, scarce believe that such a thing is possible. And the four-coupled express, as we know it now, which, with inside or outside cylinders, with or without bogie, and with or without outside

plex forms in which by that time it will appear.

It must not be forgotten that the efficiency of the locomotive can be increased in other ways beside the direct method of increasing the Grate and the Boiler. The adoption of the continuous brake has indirectly but very sensibly increased the speed of our trains during these last thirty years, and would have still further increased that speed had it not been that trains have during that time rapidly been growing in weight. The next few years will witness the adoption of some form of ball or roller bearing, which will much reduce the friction, but may we indulge in the faint and distant hope that the pneumatic tyre may yet be capable of application to railway rolling stock? Possibly some kind of air cushion between each sleeper and the rail, or some tiny hydraulic press in the same position, a pneumatic or a hydraulic chair may give elasticity, and diminish jolts and friction while we are waiting for old Time to bring us the pneumatic tyre. Meantime, while Time moves us all along, and we glibly talk of the Space covered in such and such a length of Time, no one has yet arisen who can tell us what Time

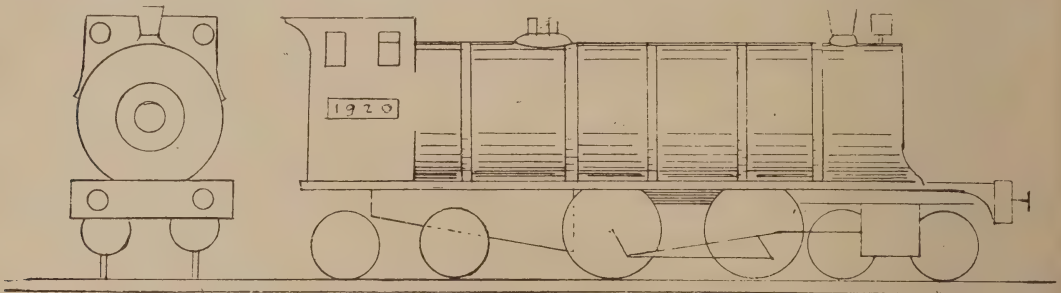


FIG. 8.—Are we coming to this? Express Engine with driving wheels 4-ft. 10-in. diameter; cylinders, 26-in. by 25-in.; boiler, 7-ft. diameter, 12-ft. long; grate area, 40-sq. ft.; heating surface, 3,200 sq. ft.

framing, now rules the road from Wick to Penzance, from Carlisle to Dover, doing, I suppose, nine-tenths of the express work of the United Kingdom, and often at the highest speeds, will scarcely know itself in the larger and more com-

plex and Space are, and whether they have any real existence outside our own minds. Without Time the "North Star" would be running still, for 1838 would coincide with 1898, and indeed with 1938 or any other year; without Space the broad-

gauge engines could have run on the standard gauge metals, or on the two foot gauge of the Festiniog, while London

wondrously real unrealities, or define them, save to say, as I have said elsewhere, that Time is the Space between

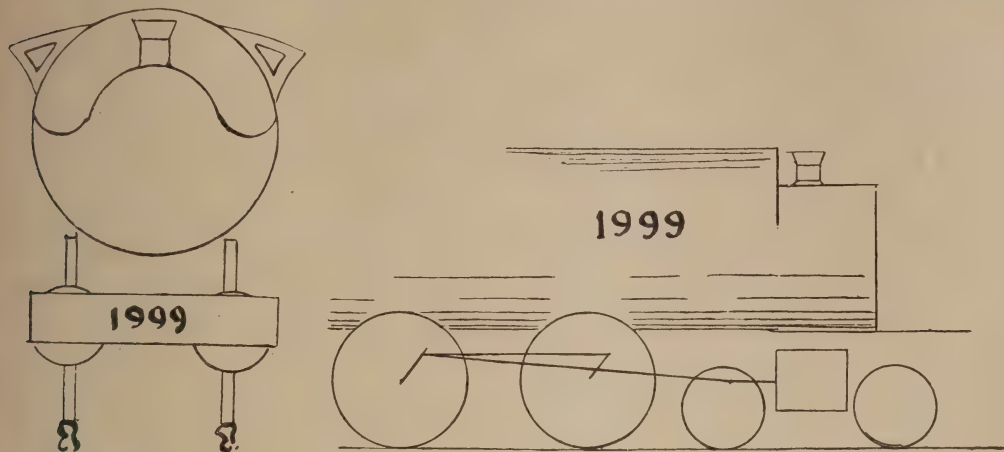


FIG. 9

We shall scarcely attain to an 8 ft. diameter boiler, which the loading gauge would just permit, which with 6 ft. "drivers" would leave little space for the smoke stack

and Bristol, Edinburgh and Dover, would all have been huddled up together on the same spot, and roads and railways have no *raison d'être*. Yet who can cage these

events, and Space the Time between positions, for is not Edinburgh some hours nearer London than it was some fifty years ago? Will 1899 bring it nearer still?



THE IMPERIAL RAILWAYS OF NORTH CHINA

BY T. RONALDSON



PROGRESS is a word which may seem rather out of place when applied to China, but to those who think that the "Middle Kingdom" has become stationary, and is making no advance for the purpose of keeping herself abreast of the Western Powers, who are contemplating the possession of some pieces of "rare old China," the following sketch of her virgin successful railway and a forecast of its future may be of interest.

The foundation of this railway is one of the few events which the Chinese historian of to-day can recall as having happened in his lifetime, for he has not to call back the ages in which China's history lies buried, but only to carry his thoughts back ten years to the yard of the Kaiping Mining Company, where the "Rocket of China" puffed to and fro to the utter amazement of the local Chinese, who thought that a real live dragon had descended amongst them.

It was from Tongshan therefore that the Imperial Railways of North China sprang, and not from Peking, as might under ordinary circumstances be supposed.

As a rustic form of civilisation had held China in a spell for many thousands of years, the wholesale introduction of this new mode of locomotion to a people who have moved themselves and their baggage in a manner to their entire satisfaction for so lengthy a period, would have certainly ended in disaster. However, this "foreign devil's machine," for so the Chinese name everything foreign to their clime, was administered in homœopathic doses, and, as John Chinaman found the medicine palatable, he has swallowed the

whole, and the cure consists of 300 miles of railroad in North China.

The manner in which this railway crept into China may appear rather complex, but it is none the less interesting, so the attention of RAILWAY MAGAZINE readers is invited to a speck of North China which has been magnified as it were under a microscope. Tongshan, therefore, was the starting point, and here a small locomotive, called the "Rocket of China," was built, and run within the mining company's works for the amusement of the Chinese. As soon as the practical utility of the foreign engine became apparent to the Chinese, a small hand-truck railroad, six miles in length, which had previously been laid down between the mines and Hu-Ko-Chuang on the borders of a level plain, was strengthened, and for the first time in the long lifetime of this nation steam took the place of the power of man and beast—in other words, the little pioneer engine hauled trucks of coal back and forward between these two points. Formerly, coal on leaving the hand-truck line was conveyed to Lutai by a canal which opened into the Petang River, and gave it an outlet to the outside world; but now this canal was dispensed with, and the original line carried right forward to the Petang River. Now fairly set agoing, the iron-road proceeded to Tongku at the mouth of the Pei-Ho, whose entrance is guarded by the famous Taku Forts.

Arrived at Tongku, the question of coal conveyance diminished, and the more serious problem of general utility presented itself. A toy railway already had been organised in Tientsin, 30 miles up the river, and when this venture also had found favour in Chinese eyes,

Tientsin and Tongku were connected by rail.

Thus it was that His Excellency Li Hung-Chang was able to open the Tientsin, Tongku, Tongshan Railway in 1888. The following 10 years have witnessed many additions to this trunk line.

Last year Pekin was afforded rail communication with her port, Tientsin, and at the other end the line has been pushed forward past Shan-hai-Kuan, where the great wall descends from the

Rumours of "foreign devils" burying Chinese babies underneath sleepers never trouble contractors at home, although cricket grounds have caused obstruction.

A thing of much more importance than that noble pastime stirs up the celestial ire of the Chinese, for they bury their dead in any quiet and suitable plot of ground, and the line that avoided these would involve itself in record sharp curves.

This railway has its material difficulties,

too, as will be seen in a short account of a journey from Pei-tai-Ho to Tientsin.

Pei-tai-Ho, it may be explained, is a delightful seaside resort on the Gulf of Pechili. It is the Brighton of Pekin, and provides a refuge from the summer heat of an extreme climate.

A fresh May morning was breaking across the Mongolian Mountain when my companion and myself bade a reluctant fare-



CONSTRUCTING THE RAILWAY IN NORTH CHINA

mountains and dives into the sea as China's new engineering triumph passes by.

The task of laying 300 miles of railroad in this conservative land was by no means a light one, for while at home there are only two obstacles, namely, difficulties of construction and securing of land; but in China superstition adds greatly to the obstructions which lie across the path of the railway pioneer.

well to the sea from the summit of the Lotus Hills. On the other side lay a broad valley, set in a brilliant green, which crossed the valley from our feet, and only seemed to lose itself in the grey mist which covered the heights beyond.

In the bend lay Pei-tai-Ho station, looking very trim in a fresh coat of whitewash, and when we arrived there the platform was crowded with chattering Chinese, who were awaiting the arrival of the

morning train. They had probably been there since daylight, for any Chinaman who doubts the veracity of his "Bradshaw" goes to the station at sunrise and there waits. To the inside of the booking-office we hied, and there, when the clerk had manipulated a frame of beads and thereon arrived at a true calculation, he handed us our tickets, neatly perforated with the date at one end.

The taking of a ticket may be an important moment in a Chinaman's life;

were in a hurry to leave this beautiful spot we decided not to write to the *Pekin Times*, this time at least.

Soon we were rolling along towards Tientsin in a commodious first-class car. In a short time the ticket-collector came strolling along the corridor, followed by a policeman, who carried a heavy stick. This guardian of the peace said to me, with a knowing smile on his face, "Suppose no man payee my ticket, my makee flog," and with these words he passed to



LI HUNG CHANG, OPENING THE TIENSIN, TONGKU, TONGSUAN RAILWAY IN 1888

nevertheless, it is no moment of joy, for the correct fare has to be paid down, and no bargaining or wrangling takes place.

Without exception, the native station-masters in all the stations of this railway are kind and obliging, and Pei-tai-Ho is no exception to this rule. This genial gentleman does much to alleviate the lot of foreign passengers who alight here and take to donkeys *en route* for the seaside. Our train made its appearance half-an-hour late but as neither of us

the scene of his labours in the second-class car.

The car in which we travelled was of the ordinary first-class type, roomy and perfectly ventilated by a clerestory roof and narrow central corridor, which ran the whole length of the vehicle.

No cushions are provided, and it is well so, for formerly these served as a refuge for certain minute stowaways of the infinitely small description. However, the present seats of rounded spar wood are

very comfortable, with the addition of the travellers' bedding. As a rule the Chinese wear such thick clothes that they never have so hard a time of it as the unlucky foreigner who sets out unprovided with bedding or cushions.

As we were well provided in this respect the scenery alone kept us from settling down. On one side rugged mountains framed themselves in the window, and in the opposite window an expanse of blue sky, and just below the green fields sloping lazily down to the sea. This spectacle so held our gaze that we had sped 20 miles down the

Here aged Chinese offer baskets of apples, but upon careful investigation one usually finds that the apples are only on the top, and that below is spread a thick layer of cabbage leaves.* From this point we wound through the spurs of the mountains, and finally came down a steep gradient of 1 in 43 to Lanchou bridge, the "piece de resistance" of engineering on this line.

Truly it is a fine structure and might grace the Thames.

Just on the other side of this bridge is Lanchou itself, and during our halt there mendicants offered eggs whose age could only be estimated when tasted.

The ubiquitous ham turned up here in its most virulent form in the shape of a dough cake having a semblance of india-rubber.

The train moved off on the stroke of eleven, and we left these aids to digestion (and reflection if eaten) in our wake, and ran smartly down



A VIEW OF THE RAILWAY AT PEKIN

valley ere we were aware of it. The speed of a Chinese train is not break-neck, and this affords excellent opportunities for viewing the surrounding country.

[That speed which would allow the stoker to jump from his tender, pick a wayside flower and present it with the compliments of the driver to the guard in the luggage van is fast enough for China.]

Half past ten o'clock found us at the very base of the mountains where the walled city of Changli and its tall pagoda blend strikingly with the steep crags which rise overhead.

from the hills to the great plain of Pechili. By mid-day we reached Tongshan, the heart which gives life to this railway. The tall chimney stacks, the rolling smoke, together with a hundred other little things, call back memories of a large manufacturing town. We left this oasis of modern civilisation at noon, and soon afterwards the bare level landscape with a glimmer of the sea in the distance reminded us that we were still in China. The next stoppage was Lutaï, a station which is adjacent to a large military camp.

The crowds of men whom China dubs

with a patch of red and calls soldiers proved amply to us that these forts were inhabited during times of peace at least. From this military beehive the railroad traverses the edge of a canal, the old road joining hands with the new. Frequent rumblings indicated that we were crossing low bridges, and therefore the marshy ground which during the rainy season is a sheet of water. So we passed on from station to station until the masts and funnels of steamers appeared upon the horizon and predicted our arrival at Tongku. In the old days when the Pei-Ho was navigable, the steamers sailed right on to Tientsin, but at the present time increasing shallowness has compelled all heavy draught vessels to remain at Tongku. For this reason Tongku is becoming a very important station on this railway system. A long stop here enabled us to see the wharves and the numerous steamers which were lying alongside. With a heavy load of passengers the train moved off towards Tientsin.

In a little over an hour the breaks went on hard, and ere the pipe and of course the inevitable novel were safely packed and the last strap adjusted, crowds of Chinese faces were flitting past the windows.

Then at length we stopped altogether, and set foot upon Tientsin station platform, our destination.

Trouble is in store for the newcomer who finds himself amidst the crowd of coolies who congregate upon the platform of Tientsin station for the purpose of pouncing upon a stranger.

Immediately a dozen porters become eager applicants for the carriage of his

luggage when two men would be quite sufficient. Each seizes a package. Moral: Never travel with too many parcels in China, and if the station policeman is not at hand with a thick bamboo the caravans formed from such an experience would be more worthy of an African explorer than a new arrival wending his way towards the waters of the Pei-Ho. By the kindness of the Railway Company a free ferry plies from bank to bank by means of a wire rope made fast to the bottom of the river. By the force of the current and a certain manipulation of the steering gear these crafts glide to and fro. The be-



THE LANCHOW RAILWAY BRIDGE, NORTH CHINA

haviour of fellow passengers is always an important feature in the enjoyment of travel by rail.

The Chinese, although they have little ways of their own in this respect, are very agreeable companions. As conversation is a natural trait in the character of a Chinaman, they may be considered fairly quiet in a railway car, but when they once step out into the fresh air, their native element, and each pleads, regardless of many other voices, the cause of his or her particular luggage, the scene can only find one parallel at home, and that is if a guard has delivered wrong fish baskets

to wrong fish wives. When passenger traffic first began, many simple Chinese, who recognised an acquaintance by the

department arose, and so American engines came into competition, and were successful in obtaining a market in two respects, and just those two respects which please the Chinese most—namely, cheapness, and prompt delivery. The British locomotives call for little comment, their good record of long service proving them to be the sound locomotives which the British forge invariably supplies. On the other hand, the American or “Baldwin” locomotives are only in their experimental stage. Among other improvements in these locomotives foreign to the British engines in China are rocking fire-bars, and a steam ejector for cleaning the smoke-box. One cannot easily



Dimensions of Passenger Locomotive, built by Messrs. Dubbs & Co., Glasgow, for the Chinese Railways.

Cylinders	... diameter	17 in.	Weight	... ..	65 tons
Coupled Wheels	do.	5 ft. 10 in.	Tank Capacity	... ..	3,500 gals.
Length Measurement	...	53 ft.	Coal Capacity	... ..	4 tons
Steam Pressure per inch, 140 lbs.					

wayside and were proud of their presence in the new foreign contrivance, pushed their heads through the windows regardless of glass; in extenuation let it be added that these poorer classes thought that if any protection was required it would have been made of paper instead of glass.

China may have imported old guns, and such like, but it is to her credit that everything in connection with the rolling stock and locomotive department is new and modern.

Although the “Rocket of China” rendered signal service towards the introduction of Railways in China, she is too small to be taken seriously into account under the head of the Locomotive Department. Pray allow the muscle of this railway to claim your attention, for in this China is not behind other nations. For many years China bought her locomotives from Britain, the chief purveyor being Messrs. Dubbs and Co., of Glasgow. On account of the rapid growth of mileage and traffic a sudden demand in this

forget the crowd of Chinese who watch these “plenty large dragons” spitting forth steam and soot.

All the cars are set on four wheeled bogies, and both in the first and second class carriages lavatory accommodation is provided without exception.

A central corridor runs from end to end, and this provides a cool draught of air in summer, but in the winter time these same cars are very cold for foreigners. With Chinese it is different, for as the frost intensifies John Chinaman grows broader with clothes, until by mid-winter his



Dimensions of new American Passenger Locomotives on the Chinese Railways.

Cylinders	19 in. diam, by 24 in. stroke	Coal Capacity	... ..	4 tons
Wheels Coupled	do. 7 ft.	Steam Pressure per sq.	...	...
Length Measurement	... 54 ft.	inch	... ..	180 l. s.
Weight	... .. 50 tons	Measurement from top	...	...
Tank Capacity	... .. 4,000 gals.	of chimney to rail	...	15 ft.

breadth compares favourably with his height.

The windows of the first class cars are of violet glass, thus reducing the hot rays of the sun, and rendering the compartment comparatively cool.

The vacuum brake has just come into use in a small way, several trains being fitted with it, and probably the reason why it is only now introduced, is that anything tangible and valuable would soon disappear from the vulgar gaze to the private pocket of a Chinese thief. A patent American claw coupling avoids the usual jolt, which, at home, would throw light luggage from the rack to the toes of the unfortunate underneath.

Almost without exception the trucks and freight cars are set on four-wheeled bogies, and this gives smoothness in running. Many are covered in with zinc, thus dispensing with tarpaulins, which would soon decay in a tropical climate.

The outward appearance of the first-class cars is not grand, plain varnish being used, but everything is made to last, and nothing to break. In appearance the second-class cars are much the same as the first.

Their interior is just as spacious, but with less comfortable seats. Second class sleeping cars of a crude type are also running, and suit a Chinaman A 1.

So much may be said for the Chinese accommodation. Now let us see what has been provided for the foreigners who form so small a proportion of the passenger traffic as compared with the Chinese.

As the first-class fares are so moderate the payment of a little extra for a special private car is neither here nor there to one who is accustomed to home tariffs.

One of these private cars can be obtained by payment of twelve dollars in addition to the ordinary fares, *i.e.* between Pei-tai-Ho and Tientsin.

These are very clean and comfortable, and the only thing that can be said against them is that the supply is not equal to the demand. The mail cars are beautifully appointed, and in these seats have been exclusively reserved for foreigners.

Reverting to the ordinary first-class car, *coupées* may be obtained therein by taking out an additional ticket with a limit of three first-class fares.

The Imperial family at Peking are not without their royal train, consisting of cars



THE ROYAL CARRIAGE IN WHICH PRINCE HENRY OF PRUSSIA TRAVELLED TO PEKIN.

on six-wheel bogies, and fitted up regardless of expense, sealed up against the day when the Dowager Empress sees fit to use it. As will be seen by the illustration, the other royal car, which was used by Prince Henry of Prussia in his journey to Peking, is also very luxurious, and runs on six-wheel bogies. Thus royalty travel on twelve wheels, while the vulgar throng travel on eight.

This is a distinction dear to the heart of any Chinaman, and he probably knows that if he were presumptuous enough to travel on 12 wheels his head would be the licence.

This brings us to the end of a passenger and freight rolling stock, which for

IMPERIAL CHINESE RAILWAYS.

TIME TABLE.

On Friday, December 2nd, the following Time Table will come into operation
UNTIL FURTHER NOTICE.

DOWN TRAINS.				UP TRAINS.			
CLASS				CLASS			
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and so the sterling amount may be figured out.

Roughly speaking, first and second class passengers are carried at the rate of $\frac{1}{2}$ d. and $\frac{1}{4}$ d. per mile respectively, which is cheap enough to suit the Chinese, and no doubt, account for the moderation with regard to speed; however, on the stretches from Pekin to Tientsin the rates are $\frac{3}{4}$ d. per mile first class, and $\frac{3}{8}$ d. per mile second class.

So much then for the railway which China has just now. What China is going to have in the future has been a subject of much speculation and anxiety to the

diverge, and thus tap the provinces through which they pass.

This might otherwise be compared to a huge triangle with Pekin as the apex, and the Yangtse as the base. The inland line will open up three provinces, Chihli, Hunan, Hupeh, and will cross the river Ho-ang-Ho, in the province of Hounan, finally striking the far inland waters of the Yangtse at Hankow. The other line keeping nearer to the coast, will traverse a small part of Chihli, and cross the Ho-ang-Ho in Shantung, thereafter following the line of the Grand Canal, will pass through the lake district of China in the



BRITISH MARINES DISEMBARKING AT TIEN-SIN STATION UPON REFUSAL OF THE CHINESE OFFICIALS TO START THE TRAIN DURING THE RECENT CRISIS AT PEKIN

nations who are fighting in the commercial arena of Pekin.

To give a detailed account of the railways which are on the brink of construction would occupy a paper in itself; nevertheless it may not be out of place to give a rough indication of the directions in which the iron horse is going to travel throughout China in the near future. Two most important trunk lines have been projected from the capital. One due south-west to meet the far inland waters of the Yangtse, the other almost due south, connecting the mouth of this great river with Pekin.

From these numerous branch lines will

Kiangtse province, and finally emerge at Nankin.

The railways of North China will have a marked effect upon any strained political situation which may arise between herself and a foreign power.

If China has really any enemies (for all the powers make great manifestations of friendship, the while lifting another plum out of the pie), Pekin will be the objective upon which they will focus their power—Pekin, where the Emperor worships earth and heaven, and the destinies of 400,000,000 yellow people are intrigued away. The power who can first show its teeth in Pekin commands the situation as far

as the Chinese are concerned. Wei-Hei-Wei is *vis-a-vis* to Port Arthur, and should Russia transport troops by means of her Siberian railway to her terminus on the Gulf of Pechili, these troops cannot safely complete the journey to Tientsin by sea as long as John Bull has any ships in Wei-Hei-Wei.

In the same way the big bear is looking out of his kennel at Port Arthur, and he also might hug in no friendly manner British transports which might be landing troops for Pekin.

With this in view, we may fairly conjecture that if a "race to the north" takes

vista, and a hope of great things to come.

China is no longer a curiosity shop where chance collectors may stray, and perchance discover something valuable, but a vast conservative land of law-abiding people, who await the stimulus which a European power can give when energy and tact are combined. The good beginning which has been made shows that a railway is a possibility in this land of great possibilities, and when in this land, pregnant with dormant riches, the hive of industry commences to hum, and a wealth of golden honey comes trickling out, the



A PASSENGER TRAIN, NORTH CHINA RAILWAY

place, the railways adjacent to Pekin will play an important part.

It is true, however, that Britain is financing the projected railway from Shan-hai-Kuan to Newchwang, and this may act as a strong buffer in event of Russia marching troops from Port Arthur to the capital.

In conclusion, it is hoped that this short and all too inadequate sketch will contribute its quatum towards leading the railway world at home to take up in earnest a question which is daily growing in importance, which nearly plunged two civilised countries into war, which opens up to the engineering trade a new

railway of North China, which has set a good precedent, should not be lost sight of in the network of iron rail which may spread itself over China next century. On the principal that "seeing is believing," and that a camera tells no lies, a number of photographs have been introduced, for the most of which my warm thanks are due to the two Chinamen who stepped from "ole custom" to "new fashion," and took many of the pictures which adorn this article. For assistance which has been courteously afforded from various other sources, the writer tenders his best thanks.

THE DEATH OF A VETERAN GUARD

A Remarkable Record on the Line



BY the death of Guard Robert Edge, which took place in London on the 18th March last, the oldest Great Central Guard in the joint ser-

vice of the Great Northern and Great Central Railway Companies passed away at the age of sixty-seven years, deeply regretted by a wide circle of friends. Of sterling character and genial disposition, it may with truth be said that Guard Edge made personal friends of a large section of the travelling public. He joined the service of the old Manchester, Sheffield and Lincolnshire Railway Company forty years ago, when it was quickly observed that he possessed just the natural qualities to make a popular passenger guard, with the result that he was very soon

practically without intermission, made daily journeys to and from these cities. During his long career it is computed that he traversed upwards of five millions of miles, equivalent to two hundred journeys round the world—certainly a phenomenal if not an absolutely unique record.

Fate decreed that, co-incident with the discontinuance of the joint service of the two Companies whom he had so long and faithfully served, he should be called away from the scenes of his labours, and that he

was never to take a journey over his old Company's new trunk line to London, which was being opened for passenger traffic in his closing moments.

A man of strong physique, he had, up to some six months ago, always enjoyed excellent health, but about this period it became evident to those who knew him intimately that the strain of his duties was beginning to have its inevitable effect upon his robust frame. Even his cheery face could not disguise a look of fatigue, nor the fact that at length

he was perceptibly going on the "down grade." Still—tho' the shadows were falling thick and fast—he never complained, and up to the moment of his being "booked off" by the hand of death he manfully stuck to his post. His illness was comparatively brief.



THE LATE GUARD EDGE

The total of whose Journeys on the Railway exceeded 5,000,000 Miles

appointed in that capacity, and for ten years his was a familiar figure in the Sheffield and Lincolnshire districts. In 1870 he was promoted to the "Special Service" Express trains running between Manchester and London, and for twenty-nine years he has,

To the end the thought of duty was uppermost in his mind, and he peacefully entered on his last trip breathing the strangely prophetic words "Right away!" Thus closed a blameless and busy life.

"Poor old Bob!" From King's Cross to Manchester the affectionate and sympathetic ejaculation ran along the line, as the sad news of his death became known. Many said "He has gone to tell Underdown and Ross that the new railway to London is opened."

Ever courteous, ever amiable and kind, it must have been such a man as Guard Edge whom Charles Dickens had in mind when relating in the following singularly appropriate terms his experience of this popular type of railway servant:—

"There he is again, in a guard's uniform, with a handsome figure and flowing beard, inspiring confidence in timid passengers. He is as gentle to the weak as he is bold to the strong, and he has not

a single button on his coat that is not up to its work. Out in the open country, at a level crossing; at the entrance to a tunnel; at every station I stop at, he is as alert as usual. There he is again, at the arrival platform, getting me out of the carriage as if I were his only charge upon earth. Is there not something in the alacrity of such men that is not acknowledged, that is not expressed in their mere wages?"

Robert Edge was born at Audlem, in Cheshire, on the 5th November 1832, and he was followed to his last resting-place, in the pretty cemetery at Finchley, on Thursday, the 23rd March, by his widow, six sons, and four daughters, who are left to mourn his loss. Of the sons, four occupy various positions in the service of different railways, and to them, at least, the respect in which their father was held, and his self-sacrificing devotion to duty, will in their railway careers continue to serve as a stimulating example.

THE WAIL OF THE LINK AND PIN.

AND must I go beneath oppressions sway?
Am I condemned by those who do not
see,

The awkward curves I meet with on the
way,
And other drawbacks noticed but by
me?

Let you to modern notions quickly fly,
The rage for changing robs the mind of
thought,
And automatic "couplings" you would try,
Unmindful of the lessons I have taught.

Let go thy way and shun me if you will,
For risen, 'tis but right that I should
fall;

Of base ingratitude I've had my fill,
And gladly go at great progression's
call.

But, ere I go, one favour I would crave,
I ask you this while halting on the
brink,
Of scrap heap which shall be my final
grave.

Allude not to me as the "missing link."

E. R. G.

THE "ROYAL OXFORD ROUTE" TO BIRMINGHAM AND NORTH WALES

By J. F. HUSBAND



NOW-A-DAYS the travelling public, whatever the object or length of their journey may be, prefer it as expeditious as possible, yet withal a comfortable one.

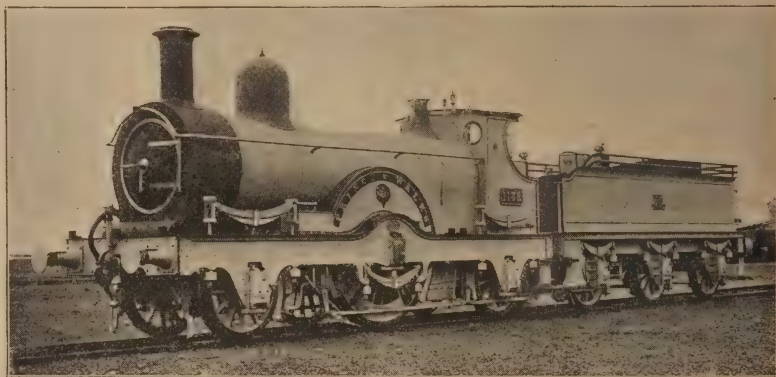
This is especially the case with a family party travelling to the seaside, or elsewhere, for a holiday; in fact, the very selection of the resort depends, to no small extent, as to whether the railway journey thence is a quick and easy one.

Numerous charming nooks on our coast are neglected, as it is a somewhat notorious fact that the getting there (especially with a party encumbered with a quantity of luggage and other necessities of a prolonged so-journ) is a somewhat protracted

undertaking. Our great railway companies are not slow in discovering these places, and every year of recent times sees further entrapments of hitherto little known portions of our beautiful island, either by new lines or a much accelerated service of what was before years behind the times, and formed almost as much a drawback as no line at all.

Some years ago, when the Great Western Railway Company acquired the Cornish lines, they found romantically situated, unostentatious fishing villages dotted here and there around the grand coast, and by a splendid service of trains,

composed of superb rolling stock, have unquestionably been the means of developing these quiet little spots into fashionable and popular seaside resorts. To wit, Newquay, Falmouth, St. Ives, etc. In a similar way, the west coast of North Wales has been popularised, and deservedly becomes more so every year with the genuine holiday-seekers. Along the grand sweep of Cardigan Bay there are villages which a few years ago were very obscure and little known, but now



"PRINCE OF WALES," ONE OF THE CLASS OF "SINGLE" ENGINES THAT HAUL THE GREAT WESTERN RAILWAY NORTH WALES EXPRESSES

have become quite up to date, with fine asphalted promenades, good shops, modern sanitary houses and hotels, and all the attributes which go to make up the ideal holiday, without the "Eiffel Towers," "Switchback Railways," "Dancing Saloons," and all the adjuncts of the "cheap special." As most people think of their Summer Holiday a considerable time before it arrives, and discuss the advantages of this place and that, and whether the railway journey to so-and-so is an easy one for children and invalids, etc., I venture to think it is not too early to draw their attention to this romantic

Welsh Coast, its healthiness, its most delightful environs, and more especially (as the title suggests) the railway journey thence. During July, August, and September of last year a special train was put on from London, to serve more especially Aberystwyth and Barmouth. It was a marvel of enterprise, and worthy of the great company who ran it. There is no doubt it will run again this next season, and be accelerated still further. And as the time for it will soon be upon us again, I hope a description of a journey in it last year will not be out of place, and I will draw attention to the varied points of interest along this route at the same time, which, of course, will serve for the

ham and North Wales express already alongside the platform, due to depart at 9.30. It seemed to be creating some little stir. A few curious people had come to see what type of engine was to make this wonderful run into the heart of the country, hitherto unprecedented, and what kind of carriages to stand such a speed, which was equal to the finest trains of the country. The engine was what is known as a 7-foot single, that is, a single driving-wheel of 7 feet diameter. It was very handsome in its radiance of polished green and shining brass, and had the exalted name of "Prince of Wales." The carriages were nearly all new, and were (to quote railway parlance) "Tri-



ordinary "all the year round" service as well; the number, and speed, etc., of which more anon.

The "Flying North Welshman" was worthy of extra notice for several reasons, the principal being that it had the distinction of being the first ordinary passenger train to run through to the "Midland Metropolis" without a stop, and that at a speed which put it in the front rank of England's crack trains. On a fine July morning last year a party of us were making our way to Paddington Station, all in high glee, for we were *en route* for "Wild Wales," far from the madding crowd. Arriving at the station about 9.15 a.m., we found the special Birmingham

composite Corridors," superb vehicles, ranking amongst the finest railway carriages in the world. They are nearly 60 feet in length, and run on eight wheels, four at each end, on a "bogie" truck, which adjusts itself to the curves, thereby keeping the motion steady at any pace. There are the usual three classes, all communicating with a lavatory, a central corridor connecting the four third-class compartments. At one end of the car is a miniature drawing-room for smokers, about 8 ft. 6 in. square, upholstered in morocco, which is impervious to the fumes of the so-called soothing weed. The fittings are of a fine character, and the ends and the sides of plate glass windows, to enable

the occupants to better observe the receding landscape, leaving nothing to be desired in this luxurious apartment. The entire carriage has a clerestoried roof, giving more air space, better ventilation, and light. These cars run through without change to Aberystwyth and Barmouth, also Liverpool (Central), a notice-board on the side or roof intimating to that effect. A conductor travels in each of the two former, taking charge of luggage, etc., and is responsible for the comfort of the passengers. We were fortunate in securing an engaged compartment in the Barmouth portion. Those having twelve full tickets can usually secure a saloon carriage if plenty of notice is given. At 9.30 prompt the signal was given, and we were soon gliding out of this huge and busy terminus, not to stop again for nearly 130 miles; we slip through Acton, Ealing, and the western residential suburbs of this modern Babylon,

and imperceptibly get into speed, bowling along the "four track" main trunk line of the Great Western Railway, which huge corporation owns over 2,500 miles of line, and has a paid-up capital approaching "one hundred millions sterling," or nearly one-tenth of the entire railway wealth of the British Isles. Our speed soon reached sixty miles an hour, but few in the train were aware of it, for the long heavy bogie carriages running on the superbly-made track of steel rails reduces the vibration to a minimum, and deceives even an experienced traveller as to the real speed of these Great Western expresses. This smoothness of running is one of their

pleasing characteristics. There is no doubt it greatly reduces the fatigue of a long journey. Station after station is passed, including Slough Junction, famous for the short line to "Royal Windsor," therefore, where the Queen joins this line when travelling. Slough is also the station nearest the famous Burnham Beeches, also Stoke Poges Church, memorable in connection with the poet Gray. Ever and anon we catch glimpses of the winding Thames, crossing it now and then, and rapidly approach Maidenhead, where the Thames is seen, perhaps, at its best. It was about here that some very high speeds were timed on this train,



Photo]

[F. Moore

THE GREAT WESTERN RAILWAY DOWN NORTH WALES EXPRESS

and that morning our pace must have been over 65. With a rattle and a roar we dashed through Twyford Junction (for Henley-on-Thames), and quickly drew near to Reading, passed through the station at reduced speed, which, however, soon increased again, in answer to the Titanic pulsations of the engine, and presently, near Goring, she picks up water from troughs laid between the rails. Passing Moulsoford, Didcot Junction is reached, and we leave the trunk line to the West of England, which Brunel constructed some sixty years ago on the 7-foot gauge, but which was altered to the standard width of only 4 ft. 8½ in. in

1892, in uniformity with all the other big companies who opposed the broad gauge on account of the enormous extra expense. As time advances the error of this becomes more apparent, for it seems they have arrived at the limit of speed on the narrow gauge. Eighty miles an hour may be said to be the utmost pace the '99 passenger express ever touches, and yet such a speed was possible, and actually accomplished, a score or more years ago on the broad gauge. What a magnificent corridor carriage could now be built for the 7 feet track to seat six a side, and yet have a

in the country running on such a narrow base of only $56\frac{1}{2}$ in. would stay on the rails; perhaps we shall have to weight them down like the keel of a "racing yacht"! It does not require any mechanical knowledge to see that the wider the base the vehicle runs on, the greater the stability, hence safety. The narrow gauge advocates (praise be to them—for they are making the best of it) argue that whatever speed was done on Brunel's track was also accomplished on the narrow gauge. True to a certain extent; but would that hold good in practice at the present day? for it must be remembered that it is now seven years since the abolition of the former, and perhaps eight or nine years since a new 7 ft. base locomotive was turned out of Swindon Works, and those had disproportionate boilers, *i.e.*, boilers that were eventually to be used on a narrow gauge frame. During that elapse of time immense improvements in construction have taken place in the standard width machines. I venture to assert that if the wide base engines



Photo by]

[M. O. Suffield, Jun.

KNOWLE STATION, A COUNTRY SUBURB OF THE
"MIDLAND METROPOLIS"

3 feet passage alongside as well, instead of the three or four aside and 20 in. passage now! Mark the difference.

When the North Eastern Railway built their new coupled engines, they claimed the same were capable of doing 100 miles an hour, and it was significantly added, it would be attempted if the new vestibule cars could be relied on to keep the metals. There you have the problem in those three words: "Keep the Metals." Personally, I believe the engines just referred to are capable, if pressed, of reaching that enormous speed, for they are remarkably powerful, but there is no car

and cars were in existence now, and had been likewise improved on the *larger scale*, Bristol would now be reached in something like 80 minutes, and Birmingham (Snow Hill) in 85 minutes, giving average speeds of about 85 miles an hour, which cannot be an excessive estimate, considering that such a speed has been reached on the narrow gauge with the engine only. The above presumptive express service would require a modern-made road of transverse sleepers, and "Bull head" rails weighing 100 lb. per yd. laid in chairs. Although we have left the track of some of the longest and fastest

runs in the world, our line is just as well laid. Soon crossing the Thames again, and yet again, ere we approach the University City of Oxford. Our train is the only one from London which does not stop here. Proceeding, we reluctantly leave the beautiful valley of the Thames behind, and shortly pass the main line to Worcester and Malvern on the left; running through several wayside stations our express reaches the quaint old market town of Banbury, where the new Great Central London Extension will be connected with the Great Western Railway by a short branch. Shortly after

as "Shakespeare's Country." Stratford, Warwick, and Kenilworth form a trio of historic interest difficult to equal. The principal scenes of the lives of such famous characters as Guy, Earl of Warwick, the Earl of Leicester, William Shakespeare, and many others, are to be seen to this day.

We slip along now through pastoral and well-wooded country (the Mediæval Forest of Arden). In quick succession we pass Knowle, Solihull, and Olton, among the favourite residential suburbs of the great city we are rapidly approaching. With a rattle and a roar, and an



THE PONTCYSYLLTAU AQUEDUCT AT LLANGOLLEN

we enter Warwickshire, and whirl along at a tremendous pace down the bank to the beautiful Spa of Leamington, which has such delightful surroundings, including a charming walk or drive to Kenilworth of some four miles. Scott has immortalised this fine ruin in his novel of that name. We cross the Avon to historic Warwick, where is the magnificent Castle, the seat of the Earls of Warwick. We now have to climb a short but stiff bank to Hatton Junction, whence a line goes to Shakespeare's Stratford-on-Avon, much visited by Americans, who, and in fact all, find much to interest them in this fascinating part of Warwickshire known

occasional warning whistle, we pass through the somewhat uninviting and thickly populated outskirts, over a long and lofty viaduct, and dash into a tunnel, during the passage of which we feel the brakes applied and soon draw into Snow Hill Station, Birmingham. Our first stop, 129½ miles in 147 minutes, an average of nearly 53 miles an hour start and stop, and including reduction of speed through several big junctions. There is no need to here describe this great and wealthy city of fine streets and buildings and beautiful parks.

We are only booked to stay seven minutes, so the platform presented an

unusually animated scene; for a large number of people leave here during the season by this express and the one following, leaving London at 9.50. This immense tourist traffic, combined with the season-ticket holders, etc., has quite outgrown this once commodious station. I understand the Company intend greatly improving and enlarging it in the near future. Several more cars are attached, and at 12.4 p.m., the Welshman, now over 500 feet in length, and weighing something over 250 tons, slowly quit this, perhaps the second busiest centre of the Great Western system, and pass through 12 miles of black country, where anything from a pen-nib to a Pulman car is made. Ere long we glide into another big station, Wolverhampton, another hardware centre, about a fifth the size of Birmingham. A prosperous town, the largest in Staffordshire. We shall now abruptly leave this vast manufacturing tract behind, which has a population of one and a quarter millions within a radius of 12 miles of Birmingham, and once more traverse the open country, running through Albrighton, the pretty village of Shifnal, into the heart of Shropshire to draw up at Wellington only to enable the Aberystwyth portion to be detached, the main portion going on immediately. In a few minutes the former proceeds, and for the convenience of the article we will follow it to its destination—"The Queen of West Wales." Leaving Wellington behind, the famous Wrekin is seen to the left rising in solitary grandeur to a height of 1,300 feet. Soon we approach Shrewsbury, but instead of entering the station (which, of course, the main portion of the Express does) we take a loop line and proceed in a westerly direction, soon to enter Wales, and gradually we draw in between two ranges of hills, the scenery becoming wilder and more interesting. At Buttington we join the "Cambrian Railways" main line, and shortly after draw up at Welshpool. Here the Seaside Express is made up of through

carriages from several different lines, our own included, and with one of the Cambrian Company's fine new engines attached we pass through central Wales, Montgomery, and Newtown, seats of the famous Welsh woollen industry, Moat Lane Junction, whence a southern extension leads by Llanidloes, Rhayader (the site of the Birmingham Corporation Waterworks), and Builth Wells to Brecon. In the vicinity of Moat Lane the express crosses the Severn several times; here a mere brook 250 miles from its mouth, and perhaps 50 from its source in Plinlimmon. At length Machynlleth is reached, and a stop made to enable passengers booked to Aberdovey, Towyn, and Barmouth, *via* this route, to change. The express then resumes its journey southward through Borth to its terminus, charming Aberystwyth, due to arrive at 4.20; the 253½ miles from Paddington having occupied 6 hours and 20 minutes, a very creditable performance considering that 60 miles of the journey is over a single line. The Great Western Railway carriages return to London, etc., at convenient times each day (Sundays excepted) throughout the year. The foregoing route was ably described in the last July number of the RAILWAY MAGAZINE, so I have made but a brief remark or two respecting it. I may add that as a health resort, apart from its charming natural attractions, Aberystwyth is not surpassed if equalled anywhere.

To return to our original train it runs rapidly on from Wellington to Shrewsbury, crossing the Severn ere entering the station. The distance of 172 miles from London having been covered in 3 hours 40 minutes. A few minutes delay, and we are off again, leaving the interesting old county town behind. Somewhere about here the "Up Afghan" will pass us; the splendid express leaving Chester at 12.15 p.m., and taking the morning connections from the West Coast back to the capital, making the fine run of 106 miles from Leamington to Paddington without a

stop. We bowl along northwards through undulating Salop. The long ranges of the Welsh hills appearing on our left, with the Berwyns rising beyond. At the wayside station of Whittington the Cambrian Railways main line passes over us, on its way from Whitchurch, to the goal of its extensive tourist traffic. Shortly we pass through Gobowen Junction for the Welsh town of Oswestry, the headquarters of the chief railroad of the Principality—the Cambrian. Proceeding, we suddenly emerge from a deep cutting, and run on to a lofty viaduct, from which we get a really fine vista of hill and vale and river. Alongside, but not so lofty, is an aqueduct constructed by Telford to carry the Ellesmere Canal over the valley. We have crossed the border now, and run through Chirk Station. In a few minutes we are whisked on to another very lofty structure, a wonderful work, declared by one of the greatest

engineers of its day to be impossible of erection. This Llangollen Viaduct spans a lovely ravine of this unrivalled vale at a height of 130 feet, which gives an entrancing panorama from the carriage window; in the distance is one of Telford's most famous works, another aqueduct, known as Pontcysylltau. It is as well to remember these viaducts before reaching them, as the view from their extreme height on a clear day is of rare grandeur. The River Dee flows through one of the arches

of the last-mentioned. Very soon we pass by Cefn, near which is Wynnstay Park, Ruabon, the magnificent seat of Sir Watkin Williams Wynn. Ere long we draw up in Ruabon Junction. The Barmouth cars are detached, and the main portion goes on to its destination, running on to Wrexham, a place of considerable antiquity, and then on down the long bank through Gresford and Rossett towards Chester, passing on the right Balderton sidings, from where the Duke of Westminster's private railway



THE RAILWAY STATION AND BRIDGE, LLANGOLLEN

runs to Eaton Hall." This was the subject of an able and entertaining article in the November number of THE RAILWAY MAGAZINE.

Crossing the Dee again, we enter the ancient City of Chester, 83½ miles from Birmingham (Snow Hill), and also 156 from Bristol, and 284½ from Plymouth *via* the Severn Tunnel.

We shall now pass across the Wirral Peninsula to Birkenhead, pausing at Rock Ferry, from which one car from Padding-

ton goes through the Mersey Tunnel into the Central Station, Liverpool.

Passengers are also booked *via* the "Royal Oxford Route" to Rhyl, Llandudno, the North Coast of Wales; also Dublin *via* Holyhead, and Belfast and the Isle of Man *via* Liverpool from Paddington, Snow Hill, etc., and Bristol and West of England *via* the Severn Tunnel, and the South by tourist or ordinary fares. At Ruabon an engine of high tractive power was attached to our sea-coast express, and without delay we retraced our steps, or rather our shining metals, a short distance, and then leave the main line and move in a westerly direction. Soon we reach Llangollen Station, with the Dee cascading along one side of the platform. By far the most beautiful and interesting portion of the journey now lies before us. The line winds along the side of the valley, probably unsurpassed anywhere in its own particular charm. Although the speed will not perhaps equal the fine travelling between London and Ruabon, owing to the track being a single one, and on much stiffer gradients and curves, the scenery will well compensate for any deficiency of speed; but, nevertheless, this train last year was only booked to stay once between Llangollen and Barmouth, and now and then spins along in fine style, rounding the picturesque curves of the line, through belts of luxuriant foliage, with glimpses ever and anon of the hills and woods on yonder side of the vale. Presently we run through Berwyn Station, and cross the rippling Dee (just as seen in the photo, of which we give a reproduction); may be we shall catch the murmur of the waters as it cascades over the boulders which lie thickly strewn in its course—a welcome change to the murmur of the traffic of a great city. Anyone who wishes for a quiet holiday amid Nature's fairest works, let him stay at Llangollen or Berwyn. If the weather be favourable he would not regret it. Passing onward, we come by Carrog to Corwen, a

favourite centre for anglers and sportsmen. Still running westward, we come to Llandrillo, the river still close by, rushing along impatiently below, crossing under us now and then to recross further on. On the left is Palé, which was honoured in 1889 by a visit from Her Majesty the Queen. Approaching Bala, the river that adds such a priceless charm to this valley is lost to view, and the junction is reached, from which a line goes through romantic mountain scenery to Festiniog. Our train now runs along the shores of the largest natural lake in Wales, a magnificent sheet of water, nearly five miles in length, affording good boating and abounding in sport. Reluctantly we leave it behind, and commence the ascent of the watershed. Coming slowly to the summit at the little station of Drws-y-Nant, at the foot of the grand mountains of Arran Benllyn and Arran Mawddwy, both over 2,900 feet, we fall rapidly into Dolgelly, the quaint capital of Merioneth. So far we have been on Great Western metals, but have now reached the terminus of this section of the biggest railway system in Great Britain. Still in our splendid Great Western corridor carriages, but now drawn by a Cambrian Company's locomotive, we start on what is considered one of the finest railway rides in the country, and if the tide is up—this is not exaggerated. When we reach Penmaenpool, the river widens out into the glorious estuary of the Mawddach, and ripples against the line most of the way. A glimpse through the window will now, perhaps, give the first peep of the sea, and what looks like a black line across the mouth of the river—that is the famous Barmouth Viaduct, one of the seven wonders of Wales. The junction is soon reached, and we turn sharply to the right, and are soon on the bridge formed of huge timbers sunk into the bed of the river; thousands of tons of rock were thrown down to secure a foundation for the giant supports. The view from here of the estuary is perfectly sublime,

especially when the tide is up. In a few minutes we draw up in Barmouth Station, due (last season) at 3.55, the 250 miles from Paddington having occupied under $6\frac{1}{2}$ hours, and from Birmingham (Snow Hill) four hours, a really creditable performance. It is a very few years since the journey took nearly double the above time. Every year have the Great Western† accelerated this service, until the special North Welshman now ranks amongst the crack trains of the country. The attractions of Barmouth are legion, and too extensive to describe here;

suffice it to say that you have here everything one looks to find in a holiday—boating, bathing, climbing, fishing, golfing, and cycling. For 30 miles the line goes on along the coast northward, through Harlech, Portmadoc, and Criccieth, to Pwllheli, the terminus; these are all well worth a visit, becoming more

popular and fashionable every year, being in close proximity to the grand Carnarvonshire Mountains, the far-famed Pass of Aberglaslyn, and romantic Beddgelert; and at Minffordd Junction visitors can join another of the Welsh wonders, "The Festiniog Toy Railway," which winds up the lovely Vale of Maentwrog to Blaenau Festiniog, from which Bettws-y-Coed is easily reached.

It is the proud boast of the "Cambrian Railways" that their lines run along the unrivalled shores of Cardigan Bay for a distance of 70 miles; and this is certainly

a fact, for from Barmouth Junction the line runs (in some places high up above the beach) down the coast through Towyn to Aberdovey, thence along the Dovey Estuary to join the main line just below Machynlleth (afore-mentioned). So the tourist may, with few exceptions, see the sea from the train from Pwllheli to Aberystwyth, a distance nearly equal from London to Swindon; perhaps not covered so quickly nor without a stop, but slowly enough for one to enjoy the romantic scenery of mountain, coast, and sea.

The Tal-y-llyn Toy Railway runs up the



[Photo]

THE BARMOUTH EXPRESS LEAVING BERWYN STATION

[F. Moore

valley to Abergynolwyn, from which vehicles ply to Tal-y-llyn Lake, an entrancing spot at the foot of Cader Idris. At Dolgoch, on the miniature line, is a beautiful waterfall. A good fishing stream falls into the sea at Towyn, called Dysynni. Near its source is the village of Llanvihangel-y-pennant, from which Cader may be ascended; in the vicinity is the Bird Rock, a stupendous crag, the haunt of cormorants and other wild birds. Tourist tickets are issued from Paddington and Snow Hill, etc., either *via* Welshpool or the Vale of Llangollen to Towyn. Mention

should be made of a new station a few miles south of Barmouth, called Fairbourne; a good hotel has been erected and a number of houses, etc., and bids fair to be favoured much, for it is backed up by grand country behind, and a firm sandy beach and glorious sea in front.

Any of the places mentioned possess all the attributes that go to make a successful holiday for a family party, or, in fact, anyone, including the by no means least consideration, the railway journey, which now by the enterprise of the Great Western and Cambrian Railways is made so easy and expeditious that it may be undertaken with a light heart, travelling in the superb corridor carriages through the Valley of the Thames, the pastoral meadows and woods and dales of Warwickshire and Shropshire; and last, but best of all, through the sublime Vale of Llangollen, which is traversed only by the royal Great Western route to Barmouth, and which, I may add, is much the shortest from Liverpool, Manchester, Chester, etc., as well as London, Birmingham, Wolverhampton, etc.

In conclusion, I should like to refer to the ordinary express service over this route. All the year round there are nine fast trains between Paddington and Birmingham each way daily, with an average speed of from 40 to 50 miles an hour. With a few exceptions these serve Wolverhampton, Shrewsbury, Chester, and Birkenhead, and *vice versa*. Among this service are some very fine trains. The famous "Afghan" leaves Paddington at 4.45 p.m., and runs to Birmingham with one intermediate stop at Oxford, slipping carriages at Reading, Banbury, and Leamington, and runs on very well northward

to Birkenhead, and has a through carriage for the Central Station, Liverpool. The return, or up "Afghan," is a splendidly-equipped train, leaving Birkenhead at 11.47 a.m., Birmingham at 2.44 p.m., running from Leamington to the Capital without stopping, slipping a coach at the University City, arriving in Paddington at 5.20, covering the last 106 miles in 125 minutes. Surely the most critical do not wish for anything better than this. Then there are four corridor trains, two between London and the Mersey Port, and two between London and Wolverhampton (low level). All of these six fine trains are warmed in the winter, well lighted with gas, and supplied with lavatories and every convenience, and travel as smoothly, or more so, than any trains in existence; this is a big thing to say, but it is a fact nevertheless. There are through connections without change to the seaside resorts (previously described) all the year round. And this route is the shortest between Liverpool, Manchester, Chester, etc., and Southampton, Portsmouth, Bournemouth, etc., *via* Birmingham and Oxford. A through carriage leaves Birkenhead daily at 9.30 a.m., and arrives in Bournemouth at 5.42, and returning at 11.10 a.m. You may leave London Road Station, Manchester, at 4.15 p.m., and Snow Hill Station, Birmingham, at 7.50 p.m., sleep the night on board one of the magnificent Great Western steamers (the fastest in the Channel), and have breakfast in lovely Jersey or Guernsey the next morning. Passengers are booked from any of the northern towns, as well as Glasgow and Scotland, to Bournemouth and the Channel Isles, *via* Weymouth, and may break their journey at various places of interest on the route.

AN ESCAPE FROM AN INFERNO

(The Monte-Carlo-La Turbie Railway)

By D. T. TIMINS, B.A.



HIS article is not, as its title would seem to indicate, an account of some blood-curdling adventure of the "penny-dreadful" type, neither does it contain any actual description of that place which an Italian poet has immortalized in 10,000 lines of gruesome verse. Nevertheless it is impossible to fitly designate the locality dealt with by any other name than that which I have assigned to it—an inferno.

Vast quantities of gushing sentiment have been expended over the outward beauties and hidden canker of Monte Carlo, and irresponsible scribblers have filled columns with their diatribes against "the plague spot of Europe." Even when divested of all the glowing and alliterative adjectives, both laudatory and damnatory, which latter-day journalism delights to heap up, the substratum of solid fact makes the word inferno only too applicable to Monte Carlo. Situated as it is in one of the most lovely parts of the globe, and with every adventitious aid to beauty which the art of the most skilled landscape gardeners can possibly give to it, Monte Carlo possesses all the makings of an earthly paradise. I do not propose to launch out into virtuous denunciations of the Casino, but merely to remark that harbouring as it does, in the suffocating "Salles des jeux," the riffraff, scum, and refuse of every nation in Europe, the wonder is that even comparative orderliness can be maintained. The lonely "Suicides' Burial Ground" bears eloquent witness to the scenes which constantly take place.

But a very easy and prosaic means of

escape from the turmoil of the Casino to the calm of the mountains which tower over Monte Carlo has now been provided. The construction of a new "Chemin de fer à crémaillère" or "rack-railway" leading from the level ground to the village of La Turbie which is situated on the heights above, has opened up a refuge in the breezy mountains from the constant hurly-burly of the town. Neither melancholy Mentone nor noisy Nice can be exactly described as peaceful nooks to which anyone in search of a little rest from the feverish life of Monte Carlo might flee. The jaded pleasure seeker need now, however, look no further than the trim little "Gare de la Turbie" for the road to the desired haven.

The line is a very fine piece of engineering, and the journey over it is sufficiently remarkable to merit description. The station from which the trains of this little mountain railway start is a very ornate structure, and like every other building in Monte Carlo, handsome and well designed. A fine flight of stone steps leads up to the "guichet" where tickets are purchased. It is worth noting that the clock outside the station shows Monaco time and not French railway time. An independent principality of the vast extent of six square miles, is far too important to degrade itself by using the standard of time adopted by its surrounding neighbours. Monaco time is in advance of French time, and herein is confusion rendered worse confounded. The Paris-Lyons-Méditerranée Company adopt the practice usual on French railroads of exhibiting Paris time *outside* their stations, and French railway time inside the building. Paris time is

one minute in advance of, and French railroad time is four minutes behind Greenwich time, so that there are three totally different standards used in this little tin-pot state, and it is impossible to tell which one of the three varieties any particular clock has elected to patronize. Verily, there are some long-suffering and easy-going folk in the world! Imagine seeing that, according to one clock, you have plenty of time in which to catch your train, or to be more correct, to reach the booking office—for in France the issue of

breathless and hot, and only to be informed that you must cool your heels on the platform for some time before the train is even due! Of course, the difference between the three times is not so very great, but still the above picture is a perfectly possible one. However, Frenchmen never indulge in the performance known as "catching a train by the skin of one's teeth," indeed, it is a virtual impossibility for them to do so, owing to the vexations and grandmotherly restrictions of the various railways. Consequently this

"comédie des heures" affects them but little.

But to return to our station, the "Gare du Chemin de Fer de Monte Carlo La Turbie." We find that it boasts of only one platform and one set of metals, and that the usual imposing array of offices is totally absent, this being perhaps the only railway in France which manages to get along with a reasonable supply of officials.



THE ROAD FOR PEDESTRIANS FROM MONTE CARLO UP TO LA TURBIE

tickets ceases five minutes before the scheduled time of departure of any train—and on arriving at the station to discover that, according to another clock, whose standard obviously differs from that of the first timepiece which you consulted, it must have actually left some minutes ago. In the reverse case, in which you take your time from a clock in reality exhibiting "l'heure de Paris" while you trustfully suppose that it is regulated according to the Monaco standard, you again hurry to the station at top speed, arriving

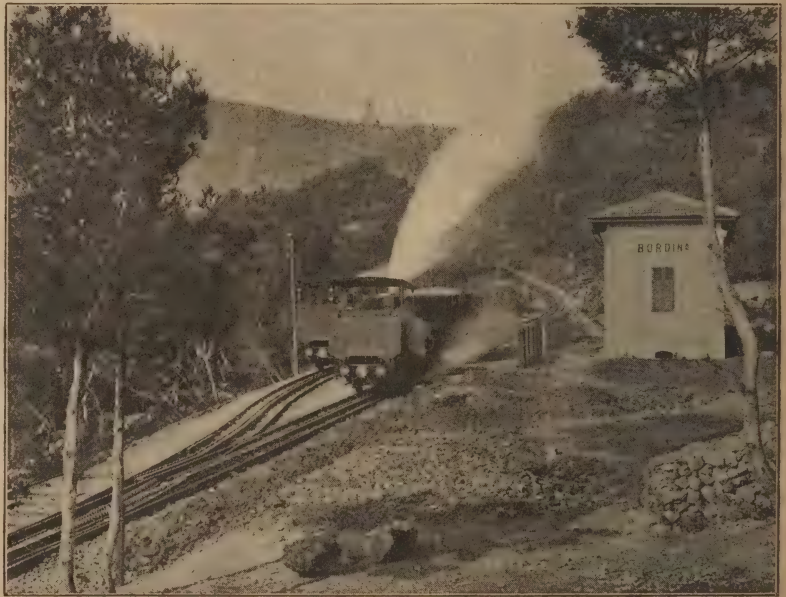
"Chef de Gare," "Sous chef de Gare," "Gendarmerie," "Octroi," "Douane," "Chef de train," "Controle," these are but a few of the bureaux always to be met with in any self-respecting French railway station. One begins to wonder whether the total absence of porters upon the arrival of any important train at a large station is not due to the fact that all those functionaries are in reality lofty officials in disguise, the arduous nature of whose higher duties precludes them from ever attending to the more

menial and useful side of their dual vocation.

The train consists of one car, drawn by a small powerful locomotive of bulldog-like appearance. The engine is of the tank variety, and possesses a single small driving wheel, while underneath the boiler a large and very solid-looking toothed wheel runs in a grooved rail fitted between the ordinary pair of metals. Slipping is virtually impossible, in fact, this cog-wheel system is the safest of all known methods employed to enable a train to climb a mountain. The engine was built by the "Société anonyme de construction mécanique d'Alsace - Lorraine" at Belfort. The small squat funnel and prodigious thickness of all parts shew the strain to which they are subjected, and serve to emphasize the need for good workmanship throughout. The locomotive *pushes* the train on the upward

journey to La Turbie, and pulls it during the descent. The car, which somewhat resembles an ordinary tram car, has transverse seats, and contains two first, and two second-class compartments. One compartment of each class is open at the sides, in order that a good view may be obtained of the scenery in fine weather, while the other is closed in all round after the manner of an ordinary railway carriage. Save that the more expensive compartments boast of a little primitive upholstery, there is virtually no

difference in the accommodation offered by the two classes. Luggage is carried on a small platform in front of the car, and a place is also provided for the conductor. The service is usually performed by two trains; but on fête days and public holidays, it becomes necessary to increase the number. The fares are very high, and are cheaper for the down than for the up journey. The charges are, 1st class, 3fr. 10c., and 2nd class, 2fr. 30c., from Monte Carlo to La Turbie, and 1st class, 1fr. 55c. and 2nd class, 1fr. 15c.



THE LA TURBIE MOUNTAIN TRAIN

from La Turbie to Monte Carlo. There is no rebate on return tickets. This differential tariff seems rather absurd, inasmuch as the time occupied both on the up and down journey is exactly the same. Bicycles are conveyed free of charge, and this is a very great convenience, for the road from La Turbie to Mentone on the one hand, and to Nice on the other, is not only magnificent, but runs down hill in both directions. But of this road more anon.

It should be noted that the Monte-Carlo-La Turbie railway has been con-

structed and is worked on the "Système Riggénbach."

The tickets are collected, the doors shut, the guard sounds a ridiculous "toot-toot" upon his horn, and the engine starts upon its journey with a series of powerful jerks, which soon settle down into a rhythmical motion. One of the steepest ascents in the whole line begins at once, and we seem to be running almost perpendicularly into the air. A party of fat and excitable Germans in our compartment commence to crane their necks out of the windows, and to indulge in their customary senseless ejaculations of "Prachtvoll!" "Wunderbar!" "Wunderschön!" etc., etc. However, even their presence cannot mar the beauty of the scene. In a very few minutes even the tallest buildings in Monte Carlo appear to be far below us, and the engine with loud regular pants is seemingly pushing us right up towards the clouds. A brief breathing space is afforded by a short break in the continuous ascent, as we run on to a flat plateau. Here the main road from Monte Carlo crosses the railway on a girder bridge. The line curves upwards to the right, and a very stiff climb takes us to Monte Carlo Supérieur. The houses are not so imposing-looking as those of the lower town, and it is evident that we are traversing a poorer quarter—though of really squalid dwellings Monte Carlo cannot be said to possess any specimens. The track again reaches level ground, and we run into Bordina Station. We have now travelled 800 mètres, and in the course of that short distance have ascended to a height of 220 mètres. Bordina is virtually little more than a passing point where the ascending and descending trains meet each other. The entire station staff consists of an old woman, who is ticket collector, signalman, station inspector, and of course octroi, gendarmerie, *et hoc genus omne*, all rolled into one—in fact, a kind of railway Pooh-Bah.

But the amount of ceremonial attendant upon the arrival and departure of this pigmy train is reminiscent of a certain small line in South Africa, upon which railway working was reduced to a very fine pitch of absurdity.

The line in question was but three miles in length, and one train went backwards and forwards thereon between the two terminal stations. Nevertheless, thanks either to the red-tapeism of some official genius, or to monumental foresight on his own part, the driver always solemnly hauled down the signal preparatory to his departure, drew the train past it, descended from the footplate, and as solemnly again raised the semaphore before proceeding on his way. The sense of security which this proceeding imparted to him must have been immense, for inasmuch as *he was the only train on the line*, it was impossible for him to collide with any one save himself, to perpetrate an Irishism.

But the panting in the distance warns us that our brief wait at Bordina is well nigh over, and that the descending train will shortly pass us. This done, we shall be able to proceed on our way in peace. The return train duly draws up alongside, and in another minute our little "bulldog" engine is puffing manfully as we once more begin to climb. A wonderful panorama gradually unfolds itself. Immediately behind us lies Monte Carlo, with the sun shining on the roof of the Casino, while the wonderful palm trees, clumps of arum lilies, and hedges of bright geraniums, interspersed with lakes, rivulets, and miniature waterfalls, give to the scene a tropical look which is intensified by the wonderful blue of the sea and sky, and the whiteness of all the buildings. To the right stretch Monaco and La Condamine, a picturesque group of buildings crowning the promontory. The royal palace of the Princelet of Monaco has been built on one side of the small peninsula, while around it are strong

fortresses used in the old days by the Saracens to resist maritime invasion. We are now skirting the Sainte Dévote valley, and a deep and thickly wooded ravine lies to our left. A mule track leads up from the main road, through the gorge and mounts rapidly, the last part of the ascent being accomplished by means of steeply graded broad steps. The line runs on to a lofty

We enter a short cutting, and once more pass under the road, which is carried over the track upon a stone bridge, the engine having ceased, for the time being, from those strident puffings and pantings in which it has been indulging, as though anxious to take breath after its labours. Another short but sharp spell of up-gradient, and we come to a halt in the



TRAIN ON THE RAILWAY FROM MONTE-CARLO TO LA TURBIE

viaduct, and the ascent grows steeper and steeper. We have reached an altitude of about 1,000 feet, and the landscape spread out before us gradually becomes more extended and more beautiful. The track seems to be almost perpendicular hereabouts, and it is with a slight but very real feeling of relief that we find ourselves, after suddenly curving again to the right, upon comparatively level ground.

little station of La Turbie. We have traversed a distance of some two miles and ascended to a height of 1,345 feet. The view from the terrace in the station is simply magnificent, whilst the clearness of the air causes objects which are in reality a long way off, to stand out with surprising distinctness. The face of the rock drops sheer to the valley beneath, and it is easy to understand how impregnable

was this fortress, which, like that at the neighbouring village of Eze, was built by Saracens. Monte Carlo and Monaco lie glinting in the sun, while the tideless Mediterranean rivals the southern sky in its depth of ultramarine paling in colour out to sea until the horizon is lost in one vast cloud of turquoise. Away to the east can be seen Cap Martin, sombre with its pine-clad groves, whilst Mentone,

The far-famed Route de la Corniche from Nice to Genoa runs through La Turbie, a road whose wonderful surface is only equalled by the skill with which it has wound its way serpent-like among the mountains of the Mediterranean Littoral. The Corniche is rightly considered to be the finest scenic highway in Europe, and throughout its entire length there is not a dull mile.

La Turbie is so strange and interesting



TRAIN NEAR THE SUMMIT OF THE LA TURBIE RAILWAY, SHOWING MONACO BELOW ON THE RIGHT

Vintimille, and Bordighera are visible as they dot the coast with their white villas, and over Monaco even the dim outlines of distant Corsica can be traced. If we turn our backs to the sea, a landscape of rocky crags meets the eye. To the left is the Tête de Chien, 576 metres in height, one of the loftiest points hereabouts of the Alpes Maritimes, while the two peaks to the right are the Mont des Batailles and Mont Justicière respectively.

a village that it merits a brief description. Of late years it has met with but scant appreciation from English visitors. They are too busily occupied in the Casino to dream of ascending the little railway, and when perhaps during the last week of their stay on the Riviera they take a hurried and perfunctory drive from Nice to Mentone—La Turbie is only known to them as a convenient half-way house in which to gorge a huge mid-day meal.

This odd little village is a group of the most picturesque buildings to be seen in Europe. Queerly gabled old houses, quaint arched passages and gateways, and the narrowest of streets and alleys go to make up a *toute ensemble*, rich in material for the antiquarian and the artist. The appearance of the village suggests the back streets of Florence, minus the disagreeable odours inseparable from the latter. But the great centre of attraction is the Tower, or to speak more correctly, its ruins, which are situated immediately behind the terminus of the railway. They show that the original building was square in form, and not only very solidly constructed of stone, but also exceedingly lofty, if the indications given by the size of the base are to be relied upon. It was a monument erected as long ago as A.D. 13 by Augustus to celebrate his victories over the Alpine tribes, the erection of which was decreed by the Roman Senate in commemoration of the final subjugation of this part of the country, and the Tower also marked the division between Provence and Liguria. The base is now used as a rubbish heap! *Sic transit gloria mundi!*

Before commencing the return journey, the strong-minded traveller is recommended to walk to the monastery of Laghet, or Notre Dame de Laghet as it is also called. Here he will see a collection of over one thousand pictures, each of which realistically depicts its donor in positions such as in the act of being cut in halves by a train, falling from the top of a house, undergoing some surgical operation which

apparently necessitates the removal of his entire internal economy, or being squashed by a heavy van—in short, as meeting with some conceivable or inconceivable variety of accident, or as undergoing some possible or impossible form of mutilation or suffering. These pictures bear so strong a family likeness to each other that they would most certainly be pronounced by an expert, from “internal evidence”—a gruesome joke, quite unintentional—to be the work of one and the same artist. They are the votive offerings of grateful persons who have miraculously escaped from the accidents and perils therein portrayed, or who have experienced marvellous recoveries from the effects of these same happenings, thanks to the direct or indirect intervention of “Our Lady of Laghet.”

If the traveller has noticed that particular pot-boiler which depicts the callous decapitation of an agonised gentleman with red hair by a locomotive with one wheel 20 ft. in diameter, the while a (supposed) signalman looks on and assists by waving the French flag, he will probably feel devoutly thankful when he safely reaches Monte Carlo. For the Monte Carlo-La Turbie Railway does not make the return journey an example of the “*facilis decensus*” state of affairs, but occupies the same time in descending as it consumed in the ascent.

Since the above was written, the Monte Carlo-La Turbie Railway has passed into the hands of the International Sleeping Car Company, and an additional station has been opened at Monte Carlo Supérieure.



A NEW ROYAL TRAIN ON THE LONDON, BRIGHTON AND SOUTH COAST RAILWAY

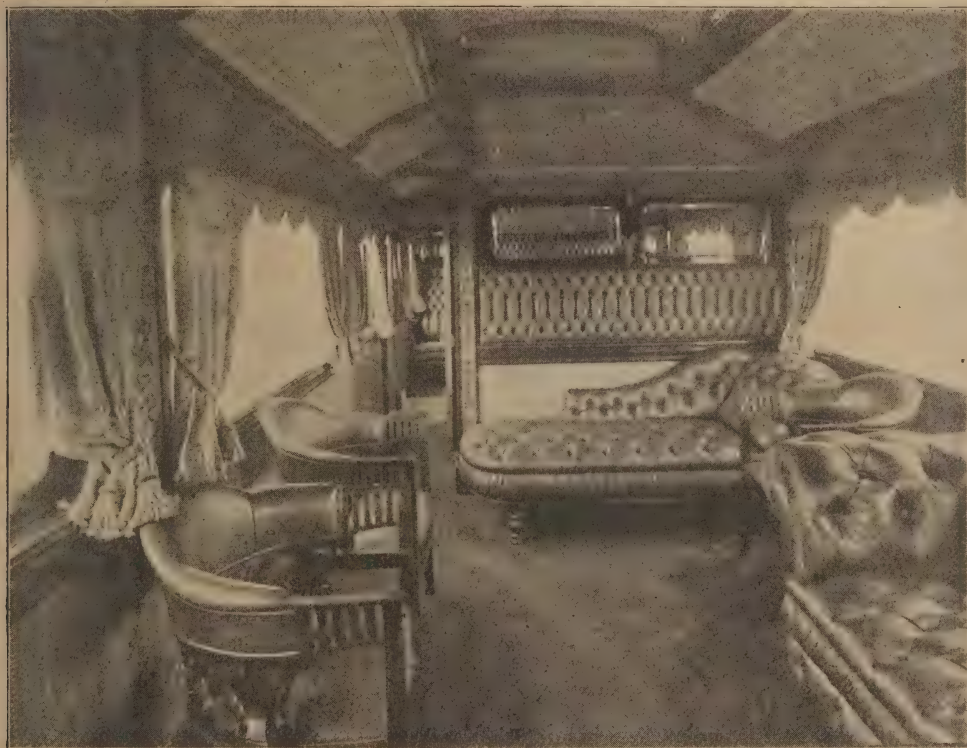
BY BRUNEL REDIVIVUS



AS soon as Mr. Gooday, the General Manager, became acquainted with the improvements necessary to bring the London, Brighton and South Coast Railway up to the standard of a leading British railway, he lost no time in giving

nuity, with the result that the London, Brighton and South Coast Railway now has a royal train that equals those of other railways.

About £8,000 have been expended by the company on its royal train. It is a series of sumptuous coaches, appealing to every possible taste in regard to colour,



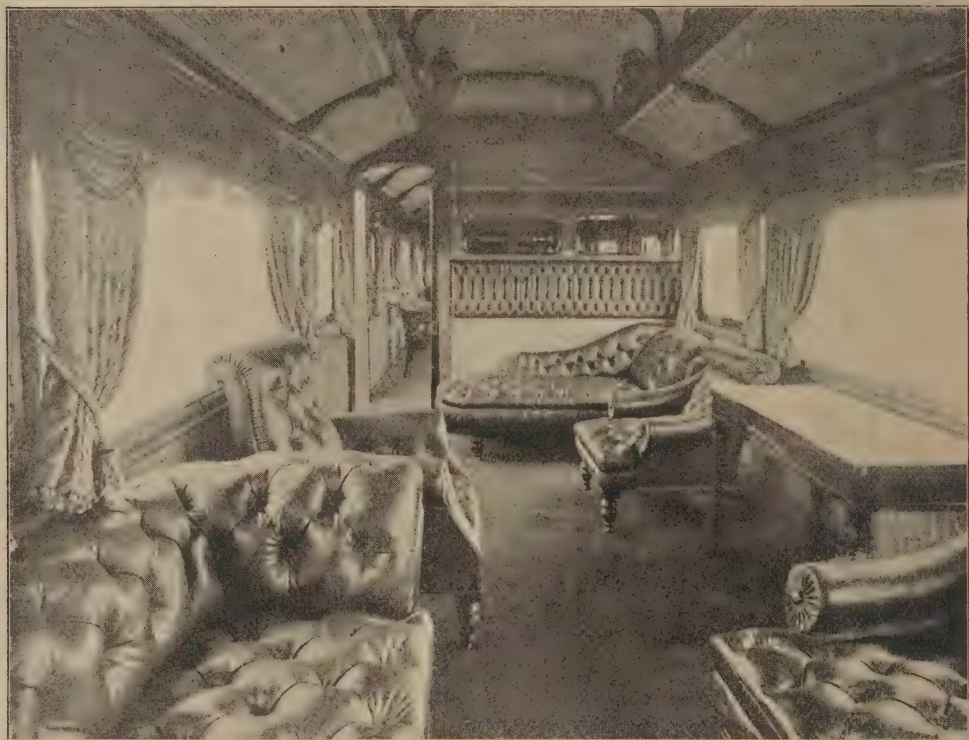
INTERIOR OF PRINCE OF WALES' SALOON IN THE NEW ROYAL TRAIN, LONDON, BRIGHTON AND SOUTH COAST RAILWAY

directions for the various improvements to be put in hand, and the new royal train is one of those upon which Mr. Billinton, the London, Brighton and South Coast Railway Locomotive and Carriage Superintendent, has spent much time and inge-

material, and style of upholstering. Mr. Billinton has been lavish in the employment of decorative woods—figured pine, Hungarian ash, mahogany, and satin wood being particularly beautiful in combination, whilst Lincrusta-Walton dados in

cream and gold, and delicately gilded entablatures are introduced beneath the clerestory roofs. There are compartments in ruby plush, in electric blue, and in green; for those who have a fancy for morocco, there are other compartments lined with this leather in plain dark green. The latter has been the choice of the Princess of Wales. Lounge, cosy-corner sofa—a novelty in its way—and armchair are all

tilated clerestory roof, and in the gilt handrails are not to be missed, whilst the mirrors and writing tables impart additional attractiveness to the interior of the saloon. It is virtually a drawing-room on wheels, about 20 ft. long and 8 ft. 9 in. wide. The total length of the royal coach is 52 ft., and it contains not only the Princess's saloon, but, divided only by a sliding door, a similar but smaller saloon,



INTERIOR OF PRINCESS OF WALES' BOUDOIR IN NEW ROYAL TRAIN, LONDON, BRIGHTON AND SOUTH COAST RAILWAY

covered with dark green morocco, perfectly plain. Another personal taste of her Royal Highness was consulted in arranging that the very large plate glass windows of the saloon should let down if necessary. They are very prettily curtained in green grey brocade.

Ornamental details, too, in the acorn-shaped electric globes which project from the coved sides of the well-ven-

14 ft. 8 in. long, tastefully furnished with lounges and smoking chairs, for the use of the Prince and his suite. There is also an attendants' compartment, and sumptuous lavatories. Twenty-six persons can travel in this one vehicle, which is supported upon 2 six-wheel bogies.

Altogether the new royal train can carry 130 persons, and its dead weight is 116 tons. A Pullman car gives an allowance

of 2 tons 1 cwt. for each passenger; so it is obvious that Mr. Billinton has adopted a much lighter system of construction without sacrifice of strength. The frames are of steel throughout. The Westinghouse brake, cord communication between guard and driver, and between passengers and guard, are provided.

This new train is not a continuous corridor one; but its uniform external design, in the mahogany colour affected by the Brighton, with the panels picked out in gold, and the Royal arms, give the train, as a whole, an air of completeness which would be sacrificed if the several coaches were detached. In all, there are five bogie

carriages, each 52 feet long—the total length of the train being 274 ft. At each end there is a composite brake carriage, having two first-class compartments and lavatory. Besides morocco and plush, Utrecht stamped velvet, in grey-green pattern, has been employed; and the carpeting throughout is the same. In one of the brakes the electrical accumulators are carried, the dynamo being worked from the axle of one pair of bogie wheels.

Mr. Gooday is to be congratulated upon his newest venture on behalf of the prosperity of the London, Brighton and South Coast Railway.

THE SONG OF THE RAILWAY GUARD.

I'm a guard, a guard, a railway guard!

I'm always on the move;

I travel about, and in and out,

And always keep the groove.

Whatever the weather may be abroad

The railway guard must work;

Through cold and heat, through rain and
sleet,

No journey must he shirk.

I watch the lives and goods of men,

At everybody's call;

If there comes a crash, I'm in the smash,

But on trust I take it all.

When the train slows down they rush at me,

And of questions comes a crop;

They want to know where the train will go,

And how long it's going to stop.

There's many an odd job I must do,

And they'll look to me for more;

This way and that, I must be pat,

But the "trippers" try me sore.

I have a smile and a kindly word

For those in need of cheer;

And some things, too, I'm bound to view

Which draw a secret tear.

I don't mind when the rich folk spare

A coin for the railway guard;

But I scorn to grip the smallest tip

From the man whose times are hard.

So on the move through life I go,

All hours of the day and night;

But glad am I when the time draws nigh

To pass the word, "All right!"

I often feel pretty well "done up,"

And long for a bit of rest;

But I keep awake for the trust at stake,

And duty's call is best.

I don't know whether there's work for me

In the land beyond the sky;

But I trust my soul, as the seasons roll,

To the Great Guard up on high.

W. BLAKE ATKINSON.

WHAT THE RAILWAYS ARE DOING

CALEDONIAN.



THE Caledonian Railway have, at present under consideration the question of putting down another set of rails between Glasgow and Motherwell, to enable them to successfully cope with the great increase of traffic over this part of their system, which is likely to be further increased when the new line from Newton is opened.

CHESHIRE LINES.

Mr. Meldrum is to be congratulated upon the excellent maps with which his time-tables are embellished. The map of England, showing the several systems of various railways in distinct colours, is specially useful. May other railways follow Mr. Meldrum's practice in this respect.

FURNESS.

In consequence of the recent decision of the Queen's Bench, that the Furness Railway is liable for passenger duty on all 3rd class tickets, which, in conjunction with the "fee" charged by them in reserving for the convenience of the public 3rd class compartments—with absolutely the same accommodation as supplied to the ordinary 3rd class passengers—makes the combined payment in excess of 1d. per mile; the directors have decided, on and from the 1st May, to abolish the system of 3rd class "reserves."

It is much to be regretted that Mr. Aslett's energetic efforts to provide superior accommodation for 3rd class passengers should thus be prevented. No doubt he will devise other means to further popularize the Furness Railway.

GLASGOW AND SOUTH-WESTERN.

The rivalry of the Caledonian and Glasgow and South-Western Railways continues to develop. Some three years ago, by mutual consent, it was agreed that the respective trains and steamers should run at such times as would avoid any element of racing on the Clyde. The agreement is about to terminate, and it is said that it will not be renewed.

GREAT CENTRAL.

The Great Central Railway's principal depôts throughout their new extension line

to London, including the extensive sidings and warehouses in Nottingham, Loughborough, Leicester, Rugby, Brackley, and London (Marylebone), etc., as well as the warehouses and receiving offices in various parts of the Metropolis, etc. were opened for goods traffic on Tuesday April 11th.

Through the agency of Messrs. Nokes and Nokes, the Railway Compensation Surveyors, the Great Central Railway have obtained commodious and admirably situated premises at Dalmeny House, close to Billingsgate Fish Market, for dealing with the important fish traffic conveyed by this railway to London.

An amusing scene was recently enacted at a large warehouse in the city of London. A Great Central Railway van drove up, followed by one belonging to a competing railway. The Great Central van was fully loaded with an immense number of large cases of goods, etc., whilst the other had to be content with two or three immense empty crates, carried free—or almost so—by the railways.

At the close of the board meeting of the Great Central Railway on Friday April 14th, the directors went to Wharncliffe House, where the Earl of Wharncliffe, the chairman of the company, presented to Mr. Pollitt, the general manager, a handsomely designed silver loving-cup in recognition of his services to the company, extending over a period of forty years. The cup bears an inscription recording Mr. Pollitt's services; and Mr. Pollitt, in reply, alluded to the fact that as a small boy he had entered the company's service as an apprentice forty-three years ago, and now, through the kindness of the directors, had been appointed general manager. Among the directors present were the Earl of Wharncliffe, Sir J. W. Maclure, M.P., Mr. Edward Chapman, Colonel Hutton, Mr. J. Henderson, M.P., Colonel Percy Surtees, Mr. A. M. Watkin, and Lord Cross.

GREAT EASTERN.

The formation of the Seven Kings Station on the Great Eastern Railway at Ilford, which cost £24,000, is to be followed by another new station near there, to be erected at a cost of over £22,000. The plans are already completed, and the new

station will be situated at Stoop Lane, which is about three-quarters of a mile beyond Seven Kings, and almost midway between that station and Chadwell Heath.

The first of the new trains, seating six a side instead of five, is now being run on the Great Eastern Railway.

At present the train only makes four double journeys a day. In the morning it runs from Enfield to Liverpool Street, then to Walthamstow and back to the City. At night it runs twice to Enfield. It is composed of 13 third-class vehicles and two 3rd class carriages with brake compartments, each seating 48 people, and there is accommodation for 60 passengers in each of the ordinary vehicles. The total capacity of the train is thus 828 passengers. This means that the train can carry about 20 per cent. more passengers than those made up of carriages seating five a side.

The train has already proved a great success, and consequently all the new carriages that are about to be made by the Company, whether for third, second, or first-class travellers, are to be wider.

There is nothing very new in the idea, as, 20 years ago, the seats of the third-class carriages of the London, Chatham and Dover Railway had the inscription, "To seat six each side," painted over them; whilst in 1847—52 years ago—some carriages on the North Woolwich branch of the Eastern Counties (now Great Eastern) Railway were constructed to seat six passengers each side, the vehicles being 9 ft. wide, 40 ft. long, and supported by eight wheels.

GREAT NORTHERN.

Since the Great Northern now "have no dealings with the" Great Central, the former line has to borrow rolling stock of the Lancashire and Yorkshire for excursion purposes, even when the trains to London are run from Lincoln, a station right in the midst of Great Central territory, but far removed from the district served by the Lancashire and Yorkshire Railway.

Tank engine No. 119 has been fitted with the Westinghouse brake for the purpose of dealing in the Metropolitan area with the trains of foreign lines that are not fitted with the automatic vacuum. No. 1,504, and similar engines of Mr. Ivatt's new ten wheel tanks (with a leading bogie, four couple, and a pair of

trailing wheels) are now working in the London suburban services; they are fitted with the condensing apparatus to enable them to work over the Metropolitan "widened lines."

GREAT NORTH OF SCOTLAND.

In the Peterhead Small Debt Court seven actions were called at the instance of the Great North of Scotland Railway Company against guarantors of the Cruden Railway, who had refused to pay the amount claimed from them in respect of the working of the railway for the year ending July last. Interest was also charged. The summonses set forth that the defenders were due the sums mentioned under their deed of guarantee in respect that the receipts from the railway, after allowing 60 per cent. for maintenance and working expenses, were insufficient for payment of interest at the rate of 4 per cent. on the capital expended on the construction of the railway; and the sum of £3,176 12s. 11d. was required to make up the deficiency for the year. Three of the actions were adjourned at the first calling, one was intimated as settled, and in the other three cases decree of consent was given.

GREAT WESTERN.

Under Mr. Wilkinson's management, this railway has energetically adopted the heating of trains by steam; the branch trains on such far-away single lines as the Brixham and Teign Valley being so fitted, to say nothing of those working over the Kingswear and Mortonhamstead branches. There is not another railway that can boast such progress in this direction. New boards for exhibiting Great Western posters are now being fixed at many of the stations. Instead of the usual style of painting the new boards are stained and varnished, whilst the heading is tastefully picked out in colours.

The Great Western Railway are progressing rapidly with the construction of the Stert and Westbury Railway and the doubling of the Berks and Hants line. It is anticipated that these works, which will give a shorter and more direct route to Weymouth than at present exists, will be completed within the present year, and that it will be possible to make arrangements to work next year's traffic with Weymouth and the Channel Islands by the new route. This arrangement, sup-

plemented by the splendid fleet of steamers which the Great Western Railway have at the present time running between Weymouth and the Channel Islands, should enable that Company to obtain a still larger share of the Channel Islands traffic.

Cornishmen are looking for the announcement of accelerated trains West of Plymouth when the summer time-tables are published, a quickening between Truro and Penzance being specially hoped for.

Commencing this month (May), the train service between London and New Milford will be accelerated; special expresses will cover the $28\frac{1}{2}$ miles in $6\frac{1}{2}$ hours.

HIGHLAND.

Mr. W. Roberts, the engineer, reports that of the earthworks on the Fort-George Branch 98 per cent. is completed, and of the masonry 90 per cent. At Fort-George Station the loop line and junction, and the branch line to Ardersier for half its length have been laid with the permanent rails. The platform and loading bank walls at Ardersier are completed, and the platform walls at Fort-George Station are also completed with the exception of the coping. The steel girders of the bridge over the public roads near Ardersier are being erected in position, and the signalling and interlocking at the junction, and the station buildings and offices at Ardersier, are well advanced.

In consequence of the wet and stormy weather since November in the high altitudes, and owing to the difficulty in getting materials distributed along the widening of the line between Blair-Atholl and the county March by the contractor's special trains running over the open single line—this difficulty being accounted for by the congestion of trains and return pilots on this section—these works, especially the masonry, have been somewhat retarded during the past half year.

Of the Soft Excavation.	67	per cent.	is completed.
„ Rock „ „	76	„ „	„
„ Drainage—Cross drains	54	„ „	„
„ Fencing	75	„ „	„
„ Bridge work	30	„ „	„

LONDON AND NORTH-WESTERN.

It is gratifying to see that Mr. Harrison, the far-sighted General Manager of the

London and North-Western Railway is adopting an economic method of supplying 2nd and 3rd class passengers with dining accommodation instead of building expensive saloons which provide a minimum of accommodation in a maximum of space. An ordinary 2nd and 3rd class composite corridor coach is placed next the kitchen portion of the 1st class dining-car; and for the convenience of those passengers in the composite carriage who require dinner, portable tables are fitted up between the seats. We hope to see this sensible plan adopted elsewhere in place of the special cars used on some lines; a saving will be effected in the cost of train-working, as the hauling of the unremunerative dead weight of special dining cars will thereby be prevented.

Mr. Frederick Harrison, the well-known General Manager, ably seconded by Mr. R. Turnbull, the Superintendent of the Line, has made another forward move in railway development by opening offices in some of the principal cities and towns on the Continent. Mr. Thos. F. Burke, Mr. Turnbull's popular chief assistant, has been appointed Superintendent of the new development, with offices in Paris, a fact that shows that the directors fully appreciate Mr. Burke's well-known abilities.

Mr. A. K. Mumford has resigned the position of Superintendent of the Running Department of the Southern Section, and Mr. George Whale, of Crewe, Superintendent of the Northern Section, has been appointed Superintendent of the Running Department of the whole of the London and North-Western Railway, with Messrs. Bowen-Cook, Rugby; Tandy, Crewe; and Muntz, Crewe, as Assistant-Superintendents.

Readers are acquainted with Mr. Bowen-Cook by reason of his contributions to the pages of the RAILWAY MAGAZINE.

LONDON AND SOUTH-WESTERN.

Mr. Samuel Fay has been appointed Superintendent of the London and South Western Railway in succession to the late Mr. G. T. White. Mr. Fay has had a previous connection of 20 years' standing with the London and South Western Railway. Starting as a junior clerk, he served at various places throughout the London and South Western system, and subsequently

was transferred to the Superintendent's Department at Waterloo, where he was Chief Assistant to the late Mr. Verrinder, Mr. White's predecessor. After this he was given an important post in the Stores Department, Nine Elms, and about seven years ago was appointed General Manager of the Midland and South Western Junction Railway. This line has been admirably managed by Mr. Fay, especially during the military manoeuvres on Salisbury Plain last autumn, when a large influx of traffic had to be conducted practically over a single line.

LONDON, BRIGHTON AND SOUTH COAST.

On Friday, April 14th, the 9.20 a.m. train from London Bridge to Victoria was slowing into the station at New Cross when it collided with a light engine which was being crossed to some down sidings. The accident was attributed to the failure of a signal to act properly. The light engine had not actually crossed the lines along which the passenger train was coming at the rate of 15 miles an hour, and, therefore, it received only a slanting blow, which was severe enough, however, to inflict some injury on both colliding engines.

Immediately after the collision the light engine, with one cylinder broken and enveloped in clouds of steam, began to move at the rate of something like 20 miles an hour on the down main line. As soon as possible, a message was dispatched to Norwood, stating that an engine had run away from New Cross, and must be stopped at once, but the message was not received in time to enable any steps to be taken to stop the engine, so the Norwood officials sent the message to Croydon. A few minutes later the engine was dashing pell-mell through East Croydon, but at the next station (South Croydon) a signalman, who had been promptly forewarned, had made the necessary arrangements to switch the locomotive into a siding, where, to use the words of a bystander, "It ploughed into an embankment and came to a dead halt, panting and exhausted." The rails were torn up for a short distance, but little further damage was done.

Some important additions are being made to the rolling stock, both for main line and suburban traffic; as regards the latter, a very fine train composed of close-

coupled long bogie-cars, lighted by electricity and replete with all the latest improvements, has made its appearance, being one of the batch of fifteen referred to in our March number, during the exceptionally heavy Easter traffic, when the demand for rolling stock is so great; it was pressed into the main line service with excellent results.

Every Saturday a special fast train leaves Victoria at 2.15 p.m. for the Crystal Palace to meet the requirements of those attending the famous Saturday afternoon concerts.

Commencing the 1st May, a new through service will be inaugurated, providing a daily "Coast Express" each way between Hastings, Bexhill, Eastbourne, Brighton, Portsmouth, and the Isle of Wight. This has supplied a long-felt want and will be much appreciated, as formerly the lack of facilities involved a long and tedious journey in travelling between those places.

It is stated that arrangements have been made whereby it is now possible to obtain a substantial hot breakfast in the Pullman fast trains leaving Brighton at 8.45, and Eastbourne at 8.30, for the city. Lunch-eons are served in the 1.20 p.m. Brighton to Victoria, the 1.50 p.m. Victoria to Brighton, and on Saturdays in the 2.0 p.m. to Brighton from London Bridge. A supper train leaves Victoria at 9.40 p.m. for Brighton, when the grill is employed; and later travellers by the 11.50 p.m. can order cold viands. All these arrangements are supplementary to the tea and coffee, with bread and butter, obtainable at any time in the Pullman cars.

MIDLAND AND SOUTH WESTERN JUNCTION.

Mr. J. Purkess, Chief Assistant to Mr. Owens, General Manager of the London and South Western Railway, has been appointed General Manager of the Midland and South Western Junction Railway in succession to Mr. Samuel Fay, who, as we announce elsewhere, has been appointed Superintendent of the Line of the London and South Western Railway, a position rendered vacant by the death of Mr. G. T. White.

NORTH BRITISH.

The first meeting of the directorate of the North British Railway since the meeting of shareholders was held in the

Company's offices at Edinburgh on 6th April. The letters from the Marquis of Tweeddale and Sir Charles Tennant resigning their seats on the Board and the Chairmanship and Vice-Chairmanship respectively were submitted to the meeting. It is stated that the reason assigned for resigning in each case was the vote of no confidence which the shareholders had virtually passed upon them in refusing to elect their nominees. The Board, after accepting the resignations, had to fill up the vacancies, and this they did by electing Sir William Laird and ex-*Provost* Moncur, Dundee. Sir William Laird was appointed Chairman and Mr. Henry Grierson Vice-Chairman.

Mr. Conacher, the able General Manager, has made arrangements for the acceleration of the mails to the Border district. The morning train by which they are sent from Edinburgh will leave at the same time as the early newspaper train. An advantage of two to three hours will thus be gained in the delivery of postal parcels. It is understood that the service to London will also be accelerated. The West letters will be brought from Glasgow to Edinburgh, by the 3.57 newspaper train, and will go into the early morning mail. By this arrangement, letters intended for London will reach the metropolis about 4.15 in the afternoon.

SOUTH EASTERN AND CHATHAM AND DOVER.

The case on behalf of the amalgamation of these two railways, which was opened at Westminster on Monday, April 17th, was listened to with evident interest by the large company present in the Committee Room, the portion of Mr. Pember's speech relating to the excellent arrangements made by Mr. Willis for the Queen's recent journey to Folkestone over the lines of the two railways being specially appreciated. On the other days of the hearing, although the South Eastern and Chatham and Dover Railways' witnesses were cross-examined by counsel on behalf of opposers, the witnesses scored remarkably well. The brilliant conduct of Mr. A. Willis, the General Manager, in the witness chair, was in a large degree responsible for the success the railways secured on Thursday, 20th April, when Lord Stanley, the Chairman, declared that the preamble of the

bill was proved. The peculiar mixture of which the opposition is composed is causing a good deal of humorous comment, but its weakness and general lack of earnestness is abundantly evident to the most casual observer.

On the arrival of the 5 o'clock London, Chatham and Dover train from Dover to Selling, on Saturday evening, April 8th, a man was discovered to be riding upon the buffer of the engine. He stated that, just as the train was leaving Canterbury, he jumped upon the engine. He also gave an incoherent statement to the effect that he had been keeping up his birthday, and thought he might finish it up well. It is feared that he is mentally deranged.

The death of Mr. J. H. Skelton of the South-Eastern Railway Company took place on Saturday morning, 25th March, after a long illness.

Mr. Skelton had been connected with the Accountants' Department of the Company from the time of his entering the service, over 40 years ago, and for many years occupied the position of Chief Accountant, only retiring from that office in December last upon his being appointed Consulting Accountant to the South-Eastern Railway, and also to the Managing Committee of the South-Eastern and London, Chatham and Dover Railways; he had also been Secretary of the Company's Savings Bank since its commencement, and in which institution he took great interest, his genial nature having earned for him the respect of all with whom he came in contact.

The funeral took place at Lewisham Cemetery on Wednesday the 29th inst., the following gentlemen connected with the Company being present:—Colonel C. F. Surtees (Director), Mr. A. M. Watkin (Director), Mr. W. R. Stevens (Director), Mr. Chas. Sheath (Secretary), Mr. Harry S. Wainwright (Locomotive and Carriage Superintendent), Mr. George Wallis (Goods Manager), and many other officials and a large number of the staff.

Floral tributes were sent by the Chairman and Directors of the South-Eastern Railway Company, Mr. W. R. Stevens, Mr. Alfred Willis (General Manager), Mr. Percy C. Tempest (Chief Engineer), Mr. C. Sheath, Mr. H. S. Wainwright, Mr. J. W. Watkin (Solicitor), the Staff of the Accountants' Office, and many others.

PERTINENT PARAGRAPHS

"Railways have rendered more services, and have received less gratitude, than any other institution in the country."—JOHN BRIGHT.



ALMOST before our last issue was published, the Government announced its intention of withdrawing the ill-advised and hastily-drafted Regulation of Railways Bill. Automatic couplings, therefore, are not likely to make their appearance on British rolling-stock at so early a date as some people expected. The withdrawal of the Bill is a further acknowledgment of the immense power of the railway interest in this country.

* * *

In connection with Parliamentary control of railways, legislators appear to lose sight of the important fact that the imposition of such burdens by Act of Parliament upon the railway industry must act as a most serious check upon industrial enterprise generally, and upon railway enterprise in particular. The increasing legislation concerning the details of a railway company's business must tend constantly to diminish the sense of responsibility on the part of directors and principal officials, and must, therefore, re-act detrimentally to the safety of railway servants and the public, in whose interest these regulations are supposed to be made. It is also evident that the methods proposed to be enforced by the Bill would in no way effect the greater safety of railway servants which was its professed object.

* * *

Despite the general adoption (in a somewhat modified form) of the suggestion for conveying passengers' luggage in advance, contained in our issue of March 1898, by the various railways, the majority of passengers continue to take their luggage with them, instead of making use of the advantages provided for their comfort and

convenience, by having it conveyed "in advance."

* * *

Nearly everybody delights in fast trains, and the slow timing of many trains during the holiday season is solely caused by the excessive quantities of passengers' luggage conveyed by them; each stop having to be prolonged for the purpose of loading up and unloading the luggage. Where sufficient time is not allowed for this purpose, delay is caused to the train, and the railways are blamed for their unpunctuality, instead of the passengers, who persist in taking huge piles of baggage whenever they travel.

* * *

If travellers will not more generally adopt the "conveyance of luggage in advance" system, the question of excluding passengers with luggage from the quickest trains will, probably, be seriously considered by the railways. The adoption of such a method would be hailed with delight by a large body of travellers, whilst the holiday passengers, who wish to avail themselves of the fastest trains, would be compelled to send their luggage in advance; a proceeding tending not only greatly to their own comfort and convenience, but also greatly reducing the cost of their travelling expenses. (This phase of the question was fully discussed in the RAILWAY MAGAZINE for March 1898.)

* * *

Recently at a well known health resort we saw the principal through express delayed from this cause ten minutes beyond the five minutes allowed for station working, whilst the corresponding up train, which is actually allowed ten minutes for loading up luggage, is frequently delayed an additional ten before the gigantic piles

can be packed in the various vans, nor is this at all an isolated case.

* * *

Our proposal regarding express non-luggage-carrying passenger trains, is applicable to every well-managed progressive railway, all of which would derive great advantages from the inauguration of services of trains somewhat after the methods we have outlined here, there can be no doubt that to enable trains that are booked at really express speeds to keep time during busy holiday months, some such a plan as that suggested above must sooner or later be adopted, and the sooner the better, both for the railways and their patrons. A train (such as the Cornishman for example) conveying passengers without luggage could easily save 15 per cent. of the time spent on a long journey were the stops at the various stations cut down to two or three minutes each. By such a train Penzance would be brought within seven hours of London.

* * *

As usual, the trades'-unionist agitator is at his usual avocation of misrepresenting the railways. One of the most notorious of these frothy individuals recently stated "that railway accidents largely filled the beds at the hospitals, and yet he never heard of a cheque being sent with the patient." In the first place, it is not a fact that "railway accidents largely fill the beds at the hospitals;" compared with many other forms of accidents, and street accidents in particular, railway accidents are extremely rare. Then the man proceeds to say that "he never heard of a cheque being sent by a railway company to a hospital." Well, we can only pity the man's ignorance, as it is well known that railway companies are amongst the most liberal supporters of the hospitals in all large railway centres. True, they do not blazon abroad their generosity in this respect, having some regard to the injunction "not to let the left hand know what the right hand doeth." However, it is a pity that these men should thus libel the railways just for the sake of "throwing mud." Probably the Parliamentary, County Council, and Trades Union duties of the speaker take up so much of his time that he has not sufficient leisure left to state

facts when they go to the credit of a railway company.

* * *

The following example of the liberality of the Great Eastern Railway is displayed in the generous gift of £100 to the fund being raised in aid of the Lowestoft Fishermen gives the lie direct to the statement commented upon above. Sir William Birt sent this handsome donation directly the local fund was started—long before the Mansion House Fund was ever suggested. The Great Eastern Railway directors have also most generously given £100 towards the Passmore Edwards Railway Men's Convalescent Home, an example which it is hoped will be emulated by every other railway. The Great Western Railway have also generously given £105 to the Mansion House Fund for the relief of the fishermen.

* * *

There is an impression abroad that the dining and buffet car, and in fact the corridor train generally, are the result of quite recent proposals. Research, however, shows that the introduction of corridor dining-car trains was seriously proposed quite 55 years ago. The following paragraph appeared in the *Gateshead Observer* during the early spring of 1845:—

"RAILWAY RESTAURANT.—A plan has been promulgated, which promises to administer largely to the luxury and comfort of those who are compelled to undertake league-long journeys between Liverpool and London, or other distant places. The invention consists in the construction of some newly-formed carriages, so as to constitute a sort of travelling café, or railway restaurant, to be placed in the rear of the carriages, which are to be so constructed as to open into one another to any extent, enabling waiters to travel along the train *ad libitum*, and relieve the *ennui* so inseparable from railway travelling, by supplies from a locomotive larder at the other end. A bill of fare, showing what the refectory contains, is to be posted in each carriage; so that passengers, first, second, and third, may at any time stay the sacred rage of hunger. Bells are to be at the command of the passengers to announce their wants to the waiter, who will travel to them along a narrow passage alongside the interior of the carriages constructed for the purpose. Should the proposed plan, which has its origin at Hull, be adopted, railway travelling may be ranked among the beatitudes."

* * *

No great progress was made with the idea; but in 1866 Mr. Jos. Mitchell, of the Highland Railway, revived the suggestion for corridor dining trains, which he proposed should be run between England and Scotland. But although the project on

this occasion was favourably received, it was not put into practice until recently.

* * *

Mr. W. H. Elwell, F.S.I., the surveyor to the Great Northern Railway, has now made his award in the claim of Hatfield *v.* the London, Chatham, and Dover Railway. That the claimant should agree to the umpire being a professional railway surveyor (considering the nature of the claim) must be considered not only as a recognition of Mr. Elwell's well-known ability and experience, but also in a greater degree as showing the implicit belief in his impartiality and justice when judging between a railway and a landowner. Regarding some gentlemen in Mr. Elwell's position, there might have been a slight suspicion of partiality towards the railway; but such an idea would not arise regarding Mr. Elwell. The claim was investigated at the Surveyors' Institution on the 19th December 1898 and 5th January 1899. Compensation was claimed in respect of the acquisition of two pieces of land near the London, Chatham, and Dover Railway's Margate Station by the railway company, for the purposes of an approach road and extension of the station.

* * *

On behalf of the claimant, the land, which is freehold, was valued at £14,694. The railway company's surveyor had valued the two plots taken, which contain 3 rods 16 poles and 3 rods 30 poles, at £2,562, to which he added the usual 10 per cent. and £500 for damage, making £3,318. His valuation on the basis of a plan, showing how the estate could be developed, amounted to £5,750, from which he deducted £3,035, his valuation of the remainder of the estate after the land acquired by the railway company had been taken off, leaving the value of the portion acquired by the railway at £2,715. The Notice to Treat was served in April 1897, and possession taken in November 1897. The railway generously agreed to give a 40 feet access on to the old road and thence on to the Marine Parade, with certain rights as to pipes under same. Mr. Elwell, awarded the claimant £7,400, just over one half of the enormous amount claimed.

The case has the appearance of "history repeating itself," as an even more extravagant claim was made by the present claimant's father some 55 years ago, when the South Eastern Railway acquired a portion of the same land for the purpose of erecting their railway station at Margate. We reproduce from a railway newspaper of that time the following report of the earlier proceedings:—

A compensation case was tried on the 28th, before Mr. Bodkin, M.P., as assessor, and Mr. Payne as Deputy Warden of the Cinque Ports at Margate, in respect of land at Margate required by the South Eastern, the details of which are rather instructive. The Attorney-General (with a special fee of 150 guineas) appeared for the claimants; Mr. W. J. Alexander, Q.C., and Mr. Merewether as counsel, and Mr. Nash, for the South Eastern. A special jury was engaged from 11 o'clock in the morning until five minutes to 12 at night. The land required by the Company was 12 acres 1 rood 19 perches of arable and pasture land, with a straight frontage of 330 feet to the Marine Parade. The whole estate and farm, comprising about 216 acres and residence, was bought by Mr. Hatfield in 1839 under the Court of Chancery for £16,880. Surveyors for the claimants respectively valued the ground, etc., wanted at £18,312, £17,178, and £18,474. Other witnesses proved the sale of other railway land at £4 4s. per foot, and the sea wall to have cost the owners 20 years ago £2 16s. to £4 per foot. For the Company, estimates were given at £4,552 5s., £3,863 5s., £3,100 10s., £4,460 7s., and £4,114 6s. The jury returned a verdict for the land and severance (including 25 per cent. agreed for forced sale) of £5,265. The claim had been rent in at £18,023, and the Company had offered £6,000.

* * *

The Hatfield family must be very pleased with their purchase of land at Hartsdown, finding as they do, that railways pay so liberally for small portions of the estate, which is still practically intact, although the South Eastern and London, Chatham, and Dover Railways have already paid for small portions; nearly as much as the whole originally cost.

* * *

Through the British workmen being compelled by their trade unions to do the smallest possible amount of work in a day, further orders for locomotive engines have gone abroad. The directors of the Barry Dock and Railway Company have decided, after mature consideration, to accept the tenders of an American firm for the supply of several locomotives for their mineral and passenger train services. They have further decided to accept tenders for the supply

of three locomotives of Belgian manufacture. The directors assert that, in addition to getting quicker delivery, the cost is about £500 less on each locomotive than they would have to pay in England, whilst the workmanship is quite as good, if not superior. By way of elucidating the point of difference between the cost of American and English engineering work, it is stated that the American workman puts in 3,100 hours on a given job compared with 1,900 by the English workman, the latter's output being limited by the rules of his union. Despite the great demand for locomotives at the present time, British capitalists will not risk their money in starting new railway-engine factories because of the action of the trade unions. By the way, the American engines were to be at work on the Midland Railway within eight weeks of the orders being given, and, as these were signed before Christmas, the American firms are evidently not as good as their word; the engines must now be nearly three months over-due.

* * * *

Those in the secret are looking forward to the 1st of May with some degree of amusement, as on that date, unless "discretion proves the better part of valour," a battle royal will take place at a certain junction within a few miles of St. Paul's. Two joint lines converge at this junction, one owned by A and Z, the other by N and Z. A and N are great rivals, and Z has been allowing trains drawn by the engines of A to pass over the N and Z joint railway. N naturally objects to these proceedings, and since the staff on the N and Z joint railway, at the junction in question, are under the authority of N, the orders which have been given by N, not to allow trains drawn by A's engines to enter upon the N and Z joint line after

the 30th April will no doubt be strictly carried out.

* * *

The number of miles of railways in operation in Canada for the year 1898, as seen by the annual Report of the Minister of Railways, the Hon. A. G. Blair, was 16,718 miles. Of this number, 16,622 miles were laid with steel rails, of which 553 miles was double track. There are 16,870 miles of railway completed. The paid-up capital amounted to \$941,297,037, an increase of \$19,439,805. The gross earnings for the year were \$59,715,165, an increase of \$7,361,829, and the working expenses aggregated \$39,137,549, an increase of \$3,968,884 compared with those of the previous year, leaving the net earnings \$20,577,556, an increase of \$3,392,945. The number of passengers carried was 18,444,049, an increase of 2,272,711, and the freight traffic amounted to 28,785,903 tons, an increase of 3,482,572 tons. The total number of miles run by trains was 50,658,283, an increase of 4,977,432. The accident returns show five passengers killed.

* * *

The April issue of "Reid's Newcastle-upon-Tyne Railway Guide" is a Jubilee Edition, the time-tables having been continuously issued since 1st April 1849. In addition to the usual matter, the Jubilee Edition of "Reid's Guide" contains a concise history of the growth of the railway system, illustrated with several engravings. The price of the number is, as usual, 2d.

* * *

BROWN: "I never could understand why the Little East West North Southern Railway is so unsuccessful."

JONES: "Nor could I—until I met the General Manager!"





Joseph Smith
Sept. 2nd.

THE RAILWAY MAGAZINE

JUNE, 1899

ILLUSTRATED INTERVIEWS

No. 24.—MR. ALFRED POWELL

Manager, Metropolitan District Railway



WITH your permission, Mr. Powell, I should like to have, for the benefit of the RAILWAY MAGAZINE readers, a few facts and figures connected with the history and progress of the Metropolitan District Railway, otherwise known as the 'District Railway,' with which you have been so long connected?"

"I shall be happy to do anything I can to further your wishes, and may well commence by stating that the first section of the District Railway was authorised in 1864, as part of a scheme formulated, out of the numerous schemes then under notice, by a Joint Committee of the Houses of Parliament of that year, whereby a circular system of communication between east and west, and north and south districts of London was to be provided.

"The first section (2½ miles) from South Kensington to Westminster was opened in December 1868, followed in April 1869 by that from Gloucester Road to West Brompton (1 mile), and in May 1870 from Westminster to Blackfriars (1½ miles), a through service of trains between West Brompton and Blackfriars commencing in August 1870.

"The railway was then worked by the Metropolitan Company, but the Directors, not being satisfied with its progress, decided to work the line themselves, and on the opening, in July 1871, of the extension (½ mile) from Blackfriars to Mansion House (Central City Station), the District Railway was for the first time run over by its own engines and rolling stock, and from this date it has been worked as an independent undertaking."

"It has since, has it not, provided and opened the various extensions that have done so much to build up the District Railway?"

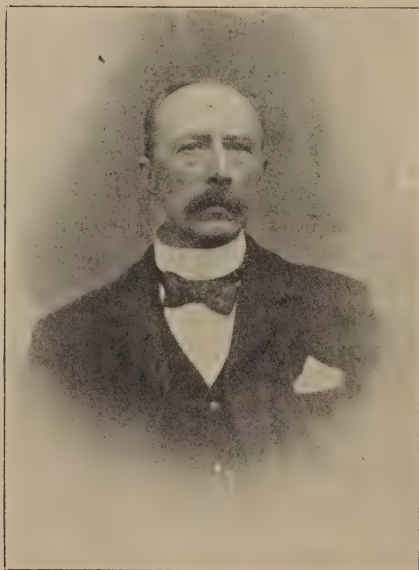
"Yes, that is so; but the fact should here be mentioned that the first Earls Court Station was opened in October 1871. This was a wooden structure on the eastern side of Earls Court Road, and the most sanguine hopes of even our far-sighted Chairman, who designed the present commodious exchange station, never anticipated it would become the nucleus of so important a traffic as has developed there. The present permanent Earls Court Station is situated on the western side of Earls Court Road, a busy centre in itself, but much accentuated in importance since the annually recurring

exhibitions have been held on the well-known Earls Court Exhibition Grounds.



MR. WILLIAM JONES
Secretary, District Railway

"In February 1872 a connection ($\frac{3}{4}$ mile) was effected with the West London Railway near Addison Road (Kensington),



MR. GEORGE ESTALL
Resident Engineer and Locomotive Superintendent, District Railway

and the London and North Western Company's trains from this date ran over what is known as the 'Outer Circle,' opening up the District Railway to Willesden and the North Western and North London systems generally. This was followed in August 1872 by the Great Western 'Middle Circle' service of trains, thereby giving the District access to the Hammersmith and City Railway and the Great Western system at Westbourne Park.

The District Railway Company's first extension, from near Earls Court to



MR. J. W. WHITTAM
Accountant, District Railway

Hammersmith ($1\frac{1}{8}$ miles), was opened in September 1874, when, it may be remarked, 'Smoking' compartments were for the first time provided on District and Metropolitan Railways.

"In June 1877, Hammersmith was connected with the South Western Railway at Ravenscourt Park ($\frac{1}{2}$ mile), and the District Company's trains commenced running to and from Kew and Richmond.

"In March 1878, the Midland Railway obtained access to the District system, and

opened goods depôts at West Kensington and High Street (Kensington).

"July 1879 witnessed the opening of the Ealing extension (3 miles) with a connection with the Great Western system, and March 1880 the Fulham extension ($1\frac{1}{2}$ miles), with a pier on the River Thames.

"In March 1883 through trains commenced running between Mansion House and Windsor, *via* Ealing, although these were, unfortunately for the public and the Company, discontinued at the instance of the Great Western Company in September 1885.

"These were followed in May 1883 by the opening of the Railway from Mill Hill

London near Earls Court, and the West London Extension at West Brompton, over the North and South Western Junction Railway at Acton, and Great Western at Ealing, while the East London line passes underneath the Thames, through the Thames Tunnel which was constructed by Sir Isambard K. Brunel.

"Many difficulties were encountered in the construction of the original line between High Street (Kensington) and the City, too numerous to now refer to, but the Company now maintain five pumping engines going day and night, *viz.* at Temple to keep out the Thames water, at Victoria to prevent spring water flooding



A HEAVY DISTRICT RAILWAY TRAIN, ENGINE No. 29 HAULING TEN OTHER LOCOMOTIVES

Park to Hounslow ($4\frac{1}{2}$ miles), and in July 1884 the extension thence to Hounslow Barracks ($1\frac{1}{2}$ miles).

"These two last-mentioned railways are owned by the Hounslow and Metropolitan Railway Company, but are worked in perpetuity by the District Company.

"You had, I think, many difficulties to contend with in the construction of the original or parent line, had you not?"

"Yes, and a heavy outlay was the result. A glance at any map of London will show that provision had to be made for passing under the South Eastern Railway at Charing Cross, and the Chatham and Dover at Blackfriars, under the West

the station, and at Sloane Square Station, over which a main sewer runs, while the two engines at South Kensington and Earls Court are for the general draining purposes of the line.

"These developments, Mr. Powell, cover a considerable period, but you have yet to mention, have you not, the most important extension of all, so far as the public is concerned, and yet the most unfortunate from the Railway Company's point of view, I refer to the Inner Circle Completion Line known as the 'City Lines and Extensions?'"

"Yes. These lines— $2\frac{1}{4}$ miles in length—were very expensive, costing a million a

"It may be incidentally mentioned that the railway was constructed without interfering in any way with the colossal statue of King William IV. (opposite Monument Station) which stands immediately over the arch of the tunnel.

"The 'Extensions' branch off from the Metropolitan, on the north, and from the District, on the south, of Aldgate, to a junction with the East London Railway, a line leased in perpetuity to the District, Metropolitan, South Eastern, Chatham and

tal expenditure without a commensurate traffic, and have accordingly been a drag upon the parent lines.

"The idea was that the completion of the Circle would develop a large local City traffic, but, as a matter of fact, this has been comparatively trifling, and the previously existing Mansion House traffic has merely been projected over the additional City stations eastwards, with the result that the increase of working expenses has been little more than covered.



INTERIOR OF MANSION HOUSE STATION, DISTRICT RAILWAY

Dover, Great Eastern, and Brighton and South Coast Companies, terminating at New Cross, where there are connections with both the Brighton and South Eastern Companies' systems.

"At St. Mary's (Whitechapel) Joint Station, there is also a junction with the District Company's own Extension to their Whitechapel (Mile End) Eastern Terminus.

"But the result of the working of these lines has been extremely disappointing, for they have involved a very heavy capi-

"The burden of interest on the very heavy unproductive capital has fallen more severely upon the District than on the Metropolitan, because the City lines were a natural projection eastwards of the District Railway through the City, while the Metropolitan, on the north, already had their own stations as far east as Aldgate, so that as the larger contribution of traffic flowed from the District Railway on to the City Lines, so their larger proportion of contribution to the deficiency in the working results follows."

"Thank you; and this leads me to mention the authorised Whitechapel and Bow Railway, which, I believe, is regarded as a very important factor in the District Company's future?"

"That is so. And this is another illustration of the foresight of our Chairman, Mr. J. S. Forbes, when he insisted on the District Company providing itself with its own terminus at Whitechapel. The Act for that railway was passed in 1897, and it will be a projection from the Whitechapel (Mile End) Station to the Tilbury line at Bromley, *via* Bow. The Railway has been taken over by the District and London, Tilbury and Southend Companies jointly, who are now proceeding with its construction.

"The importance of this short line (2 $\frac{1}{4}$ miles) will be seen when it is pointed out that it not only gives our friends, the Tilbury Company, access, *via* the District line, to all parts of London served by us, but it opens up new ground, giving us access to the Docks, and thereby affording an opportunity for developing a goods traffic over the District Railway, which for want of such an outlet in the east, they have not so far been able to obtain.

"Indeed, so great is the value put upon this connection, that negotiations with certain of the great companies are in hand with this object. A considerable revenue may therefore be anticipated from this source, more especially when the Extensions now in progress at the western end of the District Railway are completed, *i.e.*, from Ealing Common through Sudbury to Harrow—in the neighbourhood of which the Great Central Company's new lines are being constructed—and thence onwards through Ruislip to Uxbridge. A short junction, too, at Acton has just been completed, by means of which both the Midland and North-Western Railways can obtain access, not only to the growing neighbourhoods served by the Ealing and Hounslow lines, but also

to the new districts to be developed along the Harrow and Uxbridge Extensions."

"Again, in June 1889, the South Western Company, on their construction of a railway from our Fulham Station through Putney to Wimbledon, gave us running powers over it, and our trains now run to Wimbledon."

"I believe, Mr. Powell, you carry no goods traffic at present?"

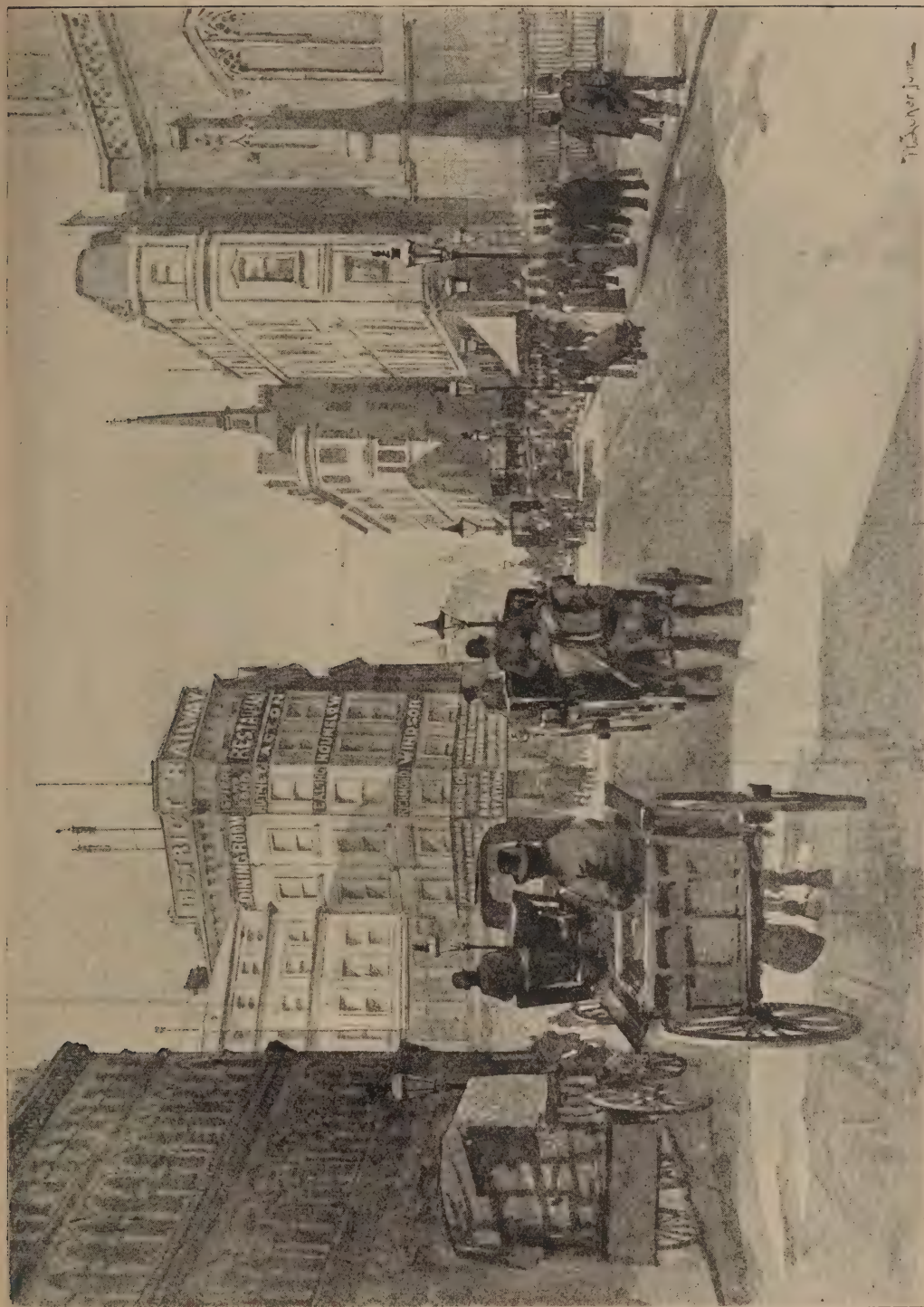
"No; the District has at present no parcels or goods traffic of its own, although certain goods trains are run over a portion of the railway by the Midland Company, to their goods depôts at West Kensington and High Street (Kensington), and about 300,000 tons per annum are so conveyed. The institution of a system under which parcels traffic can be conducted is, however, now under consideration.

"I think, Mr. Powell, I have exhausted the railways open and in construction, but has not the convenience of the public been studied in other ways, such as omnibus services?"

"Yes. For many years we have organised omnibus services, in connection with our trains, at such places as Charing Cross, Putney, Ealing, etc. We have placed indicators in our carriages, which automatically indicate to passengers the name of the station at which the train will next stop. Covered ways or subways have also been constructed, to facilitate communication with the railway.

"The Company have also, at considerable expense, prepared and freely exhibited, as well as sold at popular prices, accurate and up-to-date maps of London and the environs, and I consider these have done more than anything else to educate the public in the railway travelling facilities London possesses.

"The most important subway is at South Kensington, connecting at present that station with the Imperial Institute and the grounds of the Natural History Museum, but at an early date it will con-



EXTERIOR OF MANSION HOUSE STATION, DISTRICT RAILWAY

nect also with the South Kensington Museum. At Cannon Street a subway connects with the South Eastern Terminus, at Blackfriars a covered way gives access to St. Paul's (London, Chatham and Dover) Station, while at Victoria a subway affords communication between that station and the Chatham and Dover and Brighton and South Coast termini.

"At Earls Court a covered way exists at the western end of the station, which, although erected specially to enable the Company to cope with the large concourse of Exhibition traffic dealt with annually there, is available generally for residents.



EXTERIOR OF CHARING CROSS STATION, DISTRICT RAILWAY

"Charing Cross Station is connected by stairways with the Hungerford Foot Bridge across the Thames, in the direction of Waterloo Station, while Westminster Station is connected by subway with the Houses of Parliament (for the use of Members only), and also with the Victoria Embankment."

"That reminds me, Mr. Powell. I understand the District Railway are the owners of the land on which the Earls Court annual exhibitions are held?"

"That is partly true. We own a considerable portion of the land, but the remainder is leased to us by the Midland Company, the whole site (some 24 acres

in extent) being leased by the District Company to the London Exhibitions, Limited, of which Mr. P. Cremieu-Javal is chairman, and Mr. Imre Kiralfy is the Director-General, and to whose artistic genius the wonderful success of these exhibitions is principally due.

"These exhibitions not only provide a great attraction in London for Londoners, but tempt hundreds of thousands from the Provinces to visit the Metropolis, and form a delightful place of instruction and recreation, with entrancing gardens to promenade in, to the accompaniment of high-class music. The Greater Britain

Exhibition, which is now open, is superior in interest and attraction to any yet held.

"The Earls Court site is agreed on all hands to be exceptionally good, not only by reason of its easy access from all parts of London, but because of the excellence of its train services, no less than four stations adjoining the Exhibition grounds, facilities appreciated highly by the millions of visitors who are yearly attracted thereto. The number of visitors to these exhibitions since they commenced a few years ago probably amount to nearly 20,000,000."

"Then there is Olympia, with its mammoth entertainments from time to time, which also attract by railway to Addison Road Station many hundreds of thousands of visitors."

"Speaking of millions, Mr. Powell, I suppose these are figures which few appreciate the magnitude of, and, as your own traffic is exceptionally large, this leads me to ask for some particulars of it?"

"Yes. Perhaps it will be well to hand you a statement, giving particulars of the numbers carried, the miles of railway owned, etc. These cannot fail to afford your readers a fair idea of what the District Railway does for the public, as well

as to show the progress made in the 27 years to which they refer. Thus:—

	Year ended June	
	1872	1898
Passengers carried (excluding Season Tickets)	18 $\frac{3}{4}$ Millions	41 $\frac{1}{4}$ Millions
Number of Season Ticket Holders	3,500	26,000
Journeys performed by Season Ticket Holders	759,000	4,805,000
Percentage of Classes of Passengers carried:—		
1st	12 $\frac{3}{4}$ %	9 $\frac{1}{4}$ %
2nd	18 $\frac{1}{2}$ %	20 $\frac{3}{4}$ %
3rd	68 $\frac{3}{4}$ %	70%
Gross Revenue	£177,000	£445,000
Train Miles run on District Railway	798,000	1,397,000
Miles of Railway:—	Miles	Miles
Owned by District	7 $\frac{1}{4}$	13
Partly owned Do.	Nil	1 $\frac{3}{4}$
Jointly leased	Nil	3 $\frac{1}{4}$
Worked by District	Nil	5 $\frac{3}{4}$
Foreign Lines worked over by District	7 $\frac{1}{4}$	15 $\frac{1}{4}$
Total	14 $\frac{3}{4}$	39

Rolling Stock owned:—		
Engines (Tank)	24	54
Carriages	152	368
Ballast Wagons, etc.	3	41
Capital Expenditure on completed Lines and Works	5 $\frac{1}{4}$ Millions	7 $\frac{3}{4}$ Millions
Number of men employed	1,600	
Number of Trains in and out of Mansion House Station daily	560	
Number of Trains in and out of South Kensington Station daily	570	
Number of Trains in and out of Earls Court Station daily	520	
Number of Electrical Signals sent from the busiest Box, for the busiest hour and for one day	One hour. 200	One day. 3,150
Number of Signals, &c., Lever movements in the busiest Box, for the busiest hour, and for one day	530	7,000

"Thank you. These figures are most interesting, and perhaps you will supplement them by giving some indication of the many train services worked over the District Railway?"

"Certainly. During the busiest hours we run (morning and evening) over the sec-

tion between Gloucester Road and Mansion House 20 trains hourly in each direction, and for the remainder of the day 18, 16, or 14 trains hourly each way, according to the requirements of the traffic.

"The train services generally are as under:—

Inner Circle.	Every 10 minutes.
Middle Circle.	Half-hourly.
Outer Circle.	Half-hourly.
Whitechapel.	Four trains hourly.
New Cross.	Half-hourly.
Fulham Line.	Six Trains hourly (morning and evening), four hourly other parts of day.
Putney and Wimbledon.	Four Trains hourly (morning and evening), half-hourly other parts of day.
Hammersmith.—	Six Trains hourly.
Kew and Richmond.	Half-hourly.
Chiswick Park.	Four Trains hourly.
Acton and Ealing.	Four Trains hourly (morning and evening), half-hourly other parts of day.
Hounslow Line.	Half-hourly (morning and evening), hourly other parts of day.

"All trains are fitted with the Westinghouse brake, and are made up of 1st, 2nd, and 3rd class carriages; and, while the scale of 2nd class fares is so arranged as to approximate closely to the 3rd class—with the result that we carry nearly 21 per cent. 2nd class—the labouring classes are well provided for by a large number of workmen's trains at very low fares; in fact, over 15 per cent. of the total passengers carried are conveyed at workmen's fares."

"What is your average fare, Mr. Powell, over the whole of the railway?"

"Well, you will be surprised to hear that, for all classes and over all distances, the average fare for 1898 was only 2.18d."

"Each district train consists of nine coaches—two 1st class, three 2nd class, and four 3rd class—and the weight is, approximately, as under:—

	Engine, Coaches, gers.		Passen-	
	Tons.	Tons.	Tons.	Tons.
Unloaded	47	90	—	137
Loaded (taking Passengers at average of 10 stones each)	do.	do.	25	162

"The carrying capacity of District trains is:—

400 Passengers in all, viz:—

1st Class, 80; 2nd Class, 140; 3rd Class, 180; with a Guard's Break at each end of the Train, with accommodation for Luggage, Bicycles, etc.

"The traffic arrangements are, of course, severely taxed from time to time, on special occasions, such as Lord Mayor's

safer than any other known means of locomotion. Our Compensation Bill for the last ten years has only amounted to about £2,600, while during that time we have carried 428½ millions—nearly twice the population of British India—and never lost one life."

"The District Company not only run trains on their own system of railways, but over other Companies' lines, do they not?"

"Yes.

Over Metropolitan Railway:—Between South Kensington and Aldgate, *via* Kings Cross. [The Metropolitan Railway have parallel lines with District between South Kensington and High Street, and these Northern or Metropolitan Lines are at present run over by District for purposes of 'Inner Circle' Traffic.]

Over London and South Western Railway:—Between Putney Bridge and Wimbledon and between Junction near Ravenscourt Park and Richmond.

As one of the Lessees of the East London Railway over London, Brighton, and South Coast Railway:—Between Junction near New Cross and New Cross Station.

Over West London Railway:—Between Junction south of Addison Road Station to Junction north of Uxbridge Road Station.

Over Great Western Railway:—Between Ealing Junction and Windsor.

The two last Running Powers are not at present exercised."

"The District Railway, either by its own stations and railways, or by its connections with other railways, serves the whole of the London railway termini, and, as a



DISTRICT RAILWAY OFFICES, ST. JAMES' PARK STATION

Show Day, the Queen's Jubilee, Duke of York's Wedding, etc.; but, to the credit of the staff must it be stated that, not only during such arduous and trying times has the traffic been always conducted without any accident, but year after year rolls by without any mishap whatever that involves loss of life or injury to limb; in fact, it may be said that travelling by the underground railways is more secure and

glance at any map will show, and particularly the popular map published by the District Company, it serves the whole of the principal theatres and places of amusement."

"You have already given so much information, Mr. Powell, but there are still several points respecting which I should like to trespass longer upon your time. Take, for instance, the question of ventilation; I believe there is much to be desired, even on the District Railway, in this respect?"

"That is so, in places, notwithstanding the Company incurred very large expense in 1884 in constructing what were then termed "blow-holes." These are openings in the head of the tunnels, by means of which the products of combustion escape, and but for the fact that, in consequence of a subsequent agitation—the result of which was a compromise, under

which a few were closed—the line would be better ventilated than it is now.

"But, careful as the Company may be in their selection of the most suitable coal for their engines—and they always pay a good price for the coal they use—they cannot secure that the same coal shall be used by the engines of other Companies running over their railway; so that there must of necessity, so long as coal locomotives are used, be some foul air in the tunnels to contend with; and this cannot be wholly eliminated until it is

found possible to work the line by electricity."

"Thank you. So it would appear; and that brings up the very important factor of electrical working, which, I understand, is now receiving serious consideration?"

"Yes; the Boards of the District and Metropolitan Companies have agreed to an expenditure of £10,000 each for experiments with electrical traction, which experiments will take place on the District Line between High Street (Kensington) and Earls Court Stations. I am pleased



INTERIOR OF MR. POWELL'S PRIVATE OFFICE

to be able to state that, not only is the generating station and necessary machinery well advanced, but the experimental train is being constructed; and it is hoped that within a few months from now it will be demonstrated, beyond all possible doubt, what electrical power is necessary to deal with the heavy trains and enormous passenger requirements of the two railways. The idea is, that so soon as it is demonstrated by practical experience what is really required, that the 'Inner Circle' service of trains shall

be first equipped and run by electricity, at an estimated cost of £1,500,000, two-thirds of which will be borne by Metro-

Harrow, Uxbridge, etc., shall be run express through from Earls Court to the City, and *vice versa*, saving probably a quarter of an hour on the journey between these points.



INTERIOR OF SOUTH KENSINGTON STATION, DISTRICT RAILWAY

politan and one-third by District."

"By the way, Mr. Powell, in speaking of the electrical working of your existing railway, I believe you have already Parliamentary powers to construct an electrical railway from Earls Court to Mansion House?"

"That is so, and it is known as the 'Deep Level.' It will have a physical connection with the existing railway east of Earls Court Station, whence it will pass under Gloucester Road Station, and thence, still keeping under the existing railway, to Mansion House, with possibly one intermediate station at Victoria or Charing Cross.

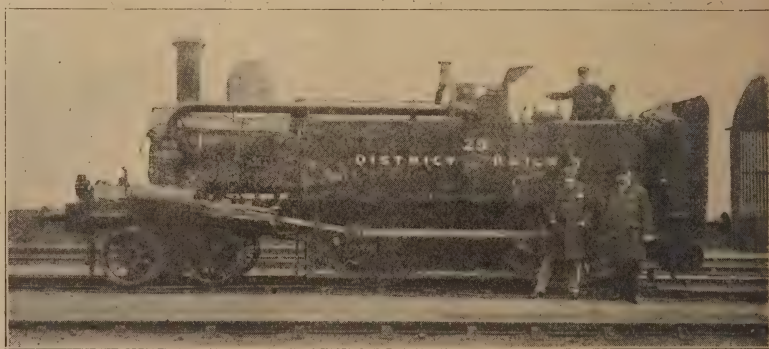
The intention is that trains arriving at Earls Court from the outlying districts of Wimbledon, Richmond, Ealing, Hounslow,

"It is now proposed to connect the 'Deep Level' at South Kensington with the authorised Brompton and Piccadilly Circus Railway—in which we are seeking powers to acquire an interest—and thereby open up a connection with the central districts of London, and also with other authorised electrical railways running north and south (when they are constructed), as well as possible extensions to the north-east of London."

"I believe also, Mr. Powell, that experiments are being made with electric light in the carriages?"

"Yes. 'Stone's' system is being experimented with, in substitution for the excellent light now given by compressed oil gas, but no decision as to adoption generally of electric lighting will be come to until the fate of electric traction is decided."

"There is one thing more, Mr. Powell, on which I would trouble you, and that is, I think I am right in saying that the Com-



A DISTRICT RAILWAY LOCOMOTIVE

pany have not been unmindful of its own employés?"

"You are quite right. The Board have

established a Superannuation Fund for the Clerical Staff, and a Savings Bank for all its servants, and all sums deposited therein

proportion to the service rendered, the District Railway is not only compelled to construct, at its own expense, the railway over which it runs, and to incur the enormous outlay which that construction involves, but it is forced to contribute £32,000 per annum in rates and taxes, and therefore pays largely towards the roads over which its competitors—the omnibuses—run.

“The asinine competition which, until within the last three or four years, existed between the Road-Car and the London General Omnibus Companies, coupled with the opening of so many new omnibus routes, has abstracted traffic from the District Railway to the extent of £40,000 per annum. This has been added to within

have the absolute guarantee of 4 per cent. up to £500, and 3 per cent. above that figure. To show that this is appreciated, no less a sum than nearly £41,000 was standing to the credit of the depositors at the end of 1898. There is also the District Railway Employés Mutual Provident Society, towards the funds of which the Directors each year contribute a considerable sum.”

“One word more, Mr. Powell, before leaving. Is it not a fact that the freedom with which omnibuses are allowed to run through the streets of London, almost without let or hindrance, militates most seriously against the District Railway?”

“Yes; but that is an old and sad story. The omnibuses are practically free from taxation; do absolutely nothing to maintain the roads over which they run; and, while their expenses—large enough as they are in themselves in comparison with their earnings—are thereby kept down to the lowest figure, enabling them to charge fares out of all

the last few months by the starting of a new Omnibus Company, which reduced omnibus fares from Putney to South Kensington, a distance of some $3\frac{1}{2}$ miles, from 3d. to 1d.; and from Putney to Charing Cross, a distance of about 6 miles, from 5d. to 2d., other fares affected being correspondingly pulled down.



INTERIOR OF EARLS COURT STATION, DISTRICT RAILWAY

“This is a most unfair competition, and would not be possible if omnibus companies had to pay something—as they

ought to do—for using the roads they run over, and towards which the railways, hampered as they are in every way by

the long-suffering Ordinary shareholders as well. No use ‘crying over spilt milk,’ however, but I hope better days are yet in store for them.”

“I am pleased to see that you are now in fine and commodious offices of your own?”

“Thank you for your good wishes. Yes, we are very glad to be in our own premises at St. James’ Park Station, after so long an experience at Parliament Mansions, and we are able to do our work with much greater comfort and economy of time, being now on the railway itself.

“And this gives me the opportunity of gladly mentioning that the management is most efficiently and loyally supported, not only by the Officers, all of whom have

been in the service since the ‘sixties’ and ‘seventies,’ and their experienced Assistants and Staff, but by the unswerving loyalty and earnest service of the Out-door Staff, whose efforts in the Company’s interest and in that of the public are deserving of the highest commendation.”

“And yourself, please——?”

“Oh! as to myself, that will do another day. This is only my fiftieth year



PUTNEY BRIDGE (FULHAM) STATION, DISTRICT RAILWAY

other considerations, have to so largely contribute.”

“No doubt, Mr. Powell, there is a great deal in what you say, and the more it is considered the more unreasonable does it appear that a Railway Company, doing so much for the London public, should be so severely handicapped; and I have no doubt the readers of the RAILWAY MAGAZINE will agree in this view. But will you tell me, are there any other causes than those you have mentioned why your Company pays no better dividend than it does?”

“Ah, indeed, yes! Look at this copy of our Half-yearly Report and Accounts. Preference Stock, £1,500,000, raised in the early days at a discount of £548,766! Debenture Stock, £1,211,625, bearing interest at 6 per cent. per annum for ever! A little financial calculation will show you that these two facts alone not only account for the deficiency on the Preference dividend, but for the postponed hopes of

of hard work, and I am a young man yet.”



EALING COMMON STATION, DISTRICT RAILWAY

FROM ROOFLESS PEN TO CORRIDOR COACH

The Evolution of the 3rd Class Carriage on the South Eastern Railway

BY D. T. TIMINS, B.A.



THE present Year of Grace will need a special chapter to itself when the history of railways comes to be written. The opening of the Great Central Company's extension to London was a national event of the first importance, and it has been quickly followed by a second of even greater interest to the travelling public. We refer to the almost accomplished amalgamation of the South Eastern with the London, Chatham and Dover Railway.

The Great Central Railway fought their way to the Metropolis by dint of dogged persistency and splendid diplomacy in the face of such apparently overwhelming opposition as a railway has seldom or never encountered in modern times. Their final triumph means increased facilities for the travelling public, paving the way as it does for the opening up of new routes of intercommunication between important centres.

The amalgamation of the South Eastern and Chatham and Dover Railways has been brought about with the same end in view. In both cases the comfort and convenience of the public were the ostensible objects of the new departures, though the means employed to obtain the desired goals are diametrically opposed to each other. As regards the Great Central, the stimulus of fresh competition is to be the *deus ex machinâ* which shall bring about important improvements in the services to and from the North; with the amalgamated companies the substitution of harmonious

agreement for erstwhile rivalry and the final burying of the competitive hatchet are to be the precursors of progressive reform. Nor are these two dissimilar courses of action incompatible with the gaining of the common end.

In the North we have populous counties teeming with close-packed towns, whose inhabitants are capable of giving adequate support to a dozen different companies. On the other hand, in the South and South-east of England, stretches a sparsely-inhabited agricultural district, boasting no town of first-rate importance, and in lieu of a rich mineral traffic the conveyance of market produce at barely remunerative rates is all that can be looked for. It cannot, therefore, be reasonably expected that the standard of the lines serving this part of the country shall be so high as that of the Great Western, North Western, or Great Central Railways. But even when due allowance is made for the many difficulties in the way of establishing a first-class train service in the South of England, it must be confessed that for a long period neither the South Eastern nor the Chatham and Dover Companies made any adequate attempt to satisfy the needs of the travelling public, or to minister to their comfort or convenience in the smallest degree.

We had occasion in a former paper to discuss some of the causes which brought about this state of affairs on the South Eastern, and later on we pointed out a few advantageous alterations which it would be possible for the amalgamated companies to make in their existing train

services.* We were glad to note that we had been to a certain extent successful in foreshadowing the policy of the joint board. It is the object of the present

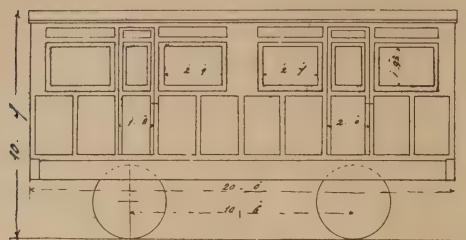


Fig. 1

ORIGINAL FIRST CLASS CARRIAGE FOR
NORTH KENT LINE

article to give some account of the 3rd class rolling stock belonging to the "predominant partner" in the newly-founded South Eastern and Chatham and Dover Railway Company, *i.e.*, the South Eastern. We have decided to devote our attention on the present occasion entirely to the 3rd class vehicles, because they are not only the greatest dividend earners, but also because their luxuriousness, or otherwise, vitally affects the comfort of 90% of the users of the line.

Seldom has a railway excited such blazes of sulphurous wrath by reason of its rolling stock as the South Eastern. Frenetic abuse and unstinted bad language have been hurled at everyone connected with the line on account of the 3rd class carriages; but never has the proverb of "Give a dog a bad name and hang him" found a better exemplification. For ten years past the rolling stock has been steadily and consistently improved, and yet very few of the habitual travellers by the line will be found willing to admit the fact. That some of it is still not up to the standard of modern requirements the officials themselves are fully aware, and this state of affairs is being remedied as rapidly as it is possible to do. To pro-

perly understand the difficult position in which they find themselves it is necessary to examine the past history of the line.

Among the early types of rolling stock may be mentioned the "North Kent" 1st class saloons with straight sides. These were built by Messrs. Adams and Co. in 1849, 39 of these vehicles being still extant, though they are fast being withdrawn from active service, and will enjoy a hard-earned "*otium cum dignitate*" as tool-sheds, platelayers' dinner rooms, and what not. It will perhaps not be out of place to record the actual dimensions of these now historic carriages—

Length ft. in.	Width ft. in.	Height from centre of buffer		Size of doorway in the clear	
		To underside of side cornice ft. in.	To top of roof in centre ft. in.	ft. in.	ft. in.
20 0	9 0	6 9	7 3	6 0½	by 1 8
		Seats—No. Wheels			
		26 6			

The 3rd class coaches at this period were roofless, but there are no surviving drawings from which their dimensions can be taken. In describing the first and later types of 3rd class vehicle of which a record has been preserved, it must not be forgotten that these South Eastern Railway vehicles were quite as commodious, or possibly more so, as contemporary 3rd coaches on other railways. The first authentic design is an eight-wheeled "teak" coach with boarded sides and

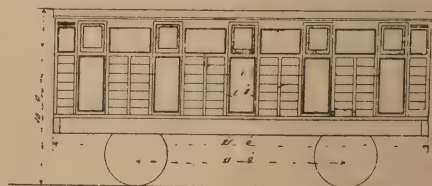


Fig. 2

THE ONLY EXISTING SPECIMEN OF AN EIGHT-
WHEEL TEAKWOOD THIRD-CLASS CARRIAGE

(Now converted to a 4-wheel coach, No. 460)

ends. Mr. Mansell, at that time Carriage and Wagon Superintendent of the South Eastern Railway caused all passenger rolling stock to be built of teak, with the

* See the RAILWAY MAGAZINE for September and December 1898.

result that it was quite impossible for it ever to wear out. This fact no doubt accounted to a certain extent for the antiquated appearance of some of the South

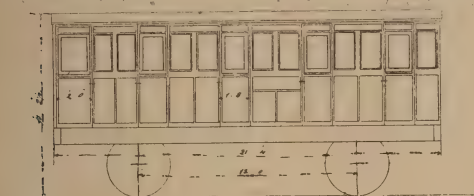


Fig. 3

THIRD CLASS CARRIAGE No. 333, FORMERLY A SECOND CLASS, AND ORIGINALLY BUILT AS A COMPOSITE

(The only specimen of the type now in use)

Eastern carriages which were running until recently. It is pretty safe to assume that these eight-wheeled "teak" thirds were originally roofless, but in their altered form as four-wheelers they at least afforded shelter from the elements. They were built by Messrs. Williams in 1851, and in their pristine form were capable of seating 50 passengers each, the space allowed for opposing knees being but $16\frac{3}{4}$ in.

It is highly satisfactory to know that only a single specimen of this bygone race drags out a dishonoured existence as a lamp carriage. It would be highly interesting to listen to the meditations of the mediæval relic when the American car train or the "Folkestone Vestibuled Limited" flashes by. It can, however, boast of one co-patriarch with whom we venture to think it is not on speaking terms. In the old days Mr. Mansell designed eighteen "Teak Composites," (fig. 3) and the year of their birth was synchronous with that of the "teak 3rds." No doubt the composites held their heads very high and refused to have any dealings with the plebeian "3rds," even when the vicissitudes of railway life coupled them together. But their "gloria mundi" made a rapid "transit," and the "composites" were

converted into "2nd class" coaches, and finally—breathe it not at Ashford!—fell to the rank of "3rds"! (fig. 3). History recordeth not whether the before-mentioned old 3rd class carriage magnanimously forgave the haughty composites when they descended in the social scale. Probably it never meets the "last of the converts." The "teak composites" were $2\frac{1}{2}$ in. higher than their contemporaries of the lower grade, and could seat 45 people; at the same time allowing them 18 in. of leg space. As we have stated, only one of this particular class also is now in use.

About this time the South Eastern Railway commenced to build some of their own rolling stock, and we find that between the years 1851 and 1858 they turned out 56 3rd class vehicles of what may be regarded as their then standard pattern. Twenty-five similar coaches were also constructed by Messrs. Brown, Marshalls and Co. Of these 81 carriages, not a single one is in existence at the present time. It is interesting to note that as lately as 1853 the Company built 17 open "3rds," and during that and the following year 16 more were built to their order by outside contract.

In 1854 and 1855 the South Eastern built

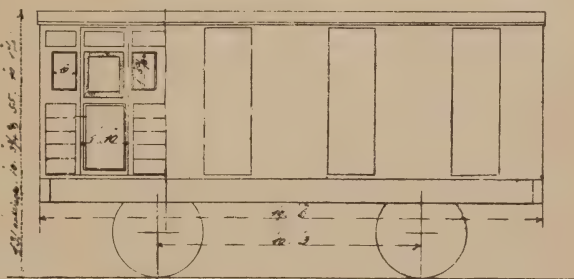


Fig. 4

A FAST-DISAPPEARING TYPE OF SOUTH-EASTERN RAILWAY THIRD CLASS CARRIAGE

(Most of these carriages have now been rebuilt in a more modern style)

eight brake 3rds of their "standard" type for use on their Greenwich branch. Oddly enough, these eight coaches have now been transferred to the other incorporated

line, *i.e.*, the Canterbury and Whitstable, where they are running at the present time.

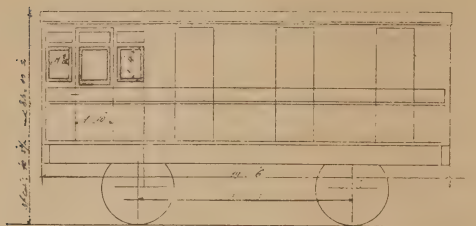


Fig. 5

A FORMER SECOND-CLASS STYLE OF SOUTH EASTERN RAILWAY CARRIAGE, NOW ALTERED INTO THIRD CLASS

The following are the particulars of these "old standard" vehicles:—

Length		Width ft. in.	Height from centre of buffer to top of roof in centre		No. of seats
ft. in.	ft. in.		ft. in.	ft. in.	
17 6	to 18 0	7 3	6 7	to 6 7½	32
“ Brake 3rds ” 19 0		7 3	6 7	to 6 7½	34
			Space between seats		No. of wheels
			17½ to 18 in.		
“ Brake 3rds ” 17½			to 18 in.		4

The years from 1862 to 1865 mark a period of great activity on the part of the South Eastern Company. The demand for 3rd class accommodation was steadily on the increase, in spite of all attempts to keep it down and to drive travellers into the two superior classes. No fewer than 186 4-wheeled 3rd class vehicles (fig. 4) were constructed in these three years for the ordinary main-line traffic, 55 of them being turned out of the Ashford shops. Of the remainder, 31 were built, in 1863, by the General Rolling Stock Company, and 100 in 1864 by the Gloucester Wagon Company. They presented no new features, and their dimensions were almost identical with those of the "old standard" class, save that the new rolling stock was 6 inches longer. The seating capacity was the same, and boarded sides and ends were still universally adopted.

The year 1865, however, saw an entirely new type of train placed upon the "Green-

wich" line. We refer to the "close-coupled" trains, in the use of which the South Eastern were, if not actually the pioneers, at any rate one of the very first companies. We believe that the North London were their only predecessors. For running in these trains some new "brake 3rds" were designed, which marked a considerable advance upon anything hitherto constructed. They were 4-wheeled coaches, with panel sides of 3 in. timber, 24 ft. in length, 7 ft. 10 in. in height, and with accommodation for 30 passengers. A space of 20 in. was allowed between the seats, implying an enormous increase in the comfort of the passengers. Eighteen of the "close-coupled" 3rds possessed a guard's and luggage compartment, which latter have recently been enlarged, for these carriages, in company with most of the "old standard" vehicles, are still at work. In all, 37 cars were built for the Greenwich line, 17 by the South Eastern Company, in the years 1864, 1869, and 1871, and 20 by the Metropolitan Carriage and Wagon Company, in 1865.

It became necessary to use "close-coupled" vehicles for suburban traffic by reason of the increasing length of the trains, which often severely taxed the platform accommodation provided for them. Indeed, railway travel was now becoming one of the common incidents of every-day life, and a passenger was no

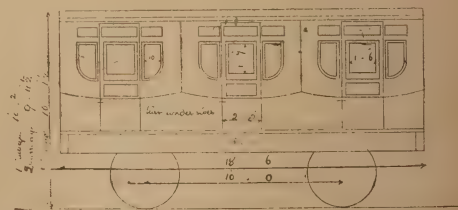


Fig. 6

THIRD-CLASS CARRIAGES TO SEAT ONLY FOUR A SIDE, BUILT AS SECOND CLASS COACHES

longer regarded with wondering awe as an intrepid explorer.

From 1868 until 1872 no new design of

3rd class coach made its appearance. We will therefore pause awhile in our survey,

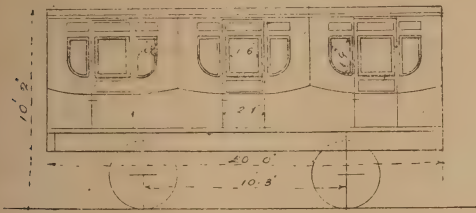


Fig. 7

SECOND CLASS COACH ALTERED TO FIRST AND THIRD CLASS COMPOSITE IN MAY, 1882

and make a fictitious rise in the social scale to "2nd class"—fictitious because all the vehicles of which we wish to treat subsequently became "converted," *i.e.*, degraded to 3rd class rank. No doubt they saw the error of their ways as they grew older, and no longer considered it to be right that they should palm themselves off upon the public as 2nd class coaches.

No fewer than 231 such carriages have at last found their true sphere. They are divided into four groups.

First we have a set of 79 coaches, with panelled sides, built by the South Eastern Railway, between the years 1854 and 1859, 28 of them being fitted with a guard's compartment and observatory in the roof. It is a notable fact that their dimensions vary very little from those of the 3rds, a slightly larger window space and a small increase in the distance between the seats being the principal advantages. The second group embraces 27 brake cars, rather higher than Group I., 17 being built by Brown, Marshall, & Co., and the remainder at Ashford. They all first saw the light in 1861 and 1862, and were capable (with six exceptions) of seating only 16 persons, as against 32 in the case of Group I. The six exceptions referred to were without luggage compartments, and therefore accommodated eight extra passengers. Only one of these vehicles has gone the way of all flesh.

The third section (fig. 5) was a very numerous one, and embraced no fewer than 120 coaches of a somewhat larger and roomier type. It is not surprising that in the case of so large a number of carriages it was found necessary to requisition the services of several firms in order to complete the full tale. The South Eastern themselves built 25 in 1860 and 19 in 1862, whilst in the same year Messrs. Wright delivered 20, and Messrs. Brown, Marshall and Co. a like number. The remaining 36 were constructed by the Oldbury Railway Carriage Company. The height of all these cars once more marked a slight increase on that of their predecessors, being 6 ft. 10 in. as against 6 ft. 9½ in. in the case Group II., and 6 ft. 7 in. in that of Group I. Otherwise no radical change of any kind was made, and, needless to say, upholstery was still *anathema maranatha*.

Group IV., though consisting of but four carriages, is historically the most interesting of all. Built in 1856-7 the very old stage-coach form of vehicle is here most typically exemplified.

No doubt many readers of the RAILWAY MAGAZINE are familiar with the old engraving of the "De Witt Clinton" hauling a train of genuine stage-coaches over the New York Central Railroad in the year 1831. The South Eastern rolling-stock under consideration exactly represents the next step in the evolution of the railway carriage, *viz.*, that in which the

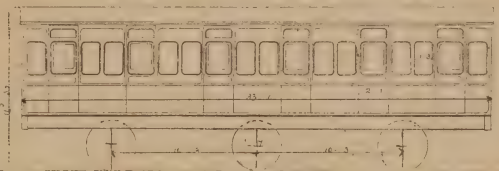


Fig. 8

SOUTH EASTERN RAILWAY SIX-WHEEL THIRD CLASS CARRIAGE

Built 1887, when four-wheel third class coaches were common on most lines

bodies of several stage-coaches were joined together to form a single compartment car.

As converted they represent a very nearly unique type of third-class vehicle (fig. 6). The following are particulars of their dimensions:—

Maker's Name and Date.			Quality.	Length.	
				ft.	in.
Wright	...	1856	I	18	0
Oldbury Co.	...	1856	I	18	6
Oldbury Co.	...	1857	I	18	6
S. E. R. Co.	...	1857	I	20	0

Width.		Height (from centre of buffers to top of roof in centre).		Seats.	No. of Wheels.
ft.	in.	ft.	in.		
7	3	6	7½	24	4
7	3	6	7½	24	4
7	3	6	9½	24	4
7	3	6	10½	24	4

In the same category as the last-mentioned coaches may be placed four other second-class cars (fig. 7), which were built



Fig. 9

SOUTH EASTERN RAILWAY THIRD CLASS BOGIE CARRIAGE

Built 1880, long before other railways had generally adopted the type

at the same time and to exactly the same pattern. Their fate has been unique, and it would be hard to say whether they have gone up or down in the world, for they were refitted in May 1882 as "first and third-class composites!" They are much in the same position as was *Iolanthe* when he discovered himself to be half fairy and half man, for it is difficult to assign to them any particular position in the ordinary scale of evolution.

Up to this time all third-class rolling-stock had been exceedingly niggardly as to space. Ten corpulent persons would have split any of the carriages into fragments.

The year 1872 was distinguished by the first real concessions being made to the needs of third-class travellers. An entirely new variety of vehicle was designed,

of a size more closely approximating to modern requirements, and giving an amount of light and roominess hitherto undreamt of. One such coach (fig. 8), was built more or less as an experiment at Ashford, and gave results so satisfactory that 30 more were ordered from the Midland Wagon Company in 1873, whilst the South Eastern themselves turned out a further 19 in 1874. The new carriages were 27 ft. in length, 8 ft. 4 in. in width, 7 ft. 10 in. in height from the centre of the buffer to the centre of the top of the roof, and provided seating accommodation for 50 passengers.* The single particular in which they showed no improvement worth speaking of was in the matter of space between the seats, a paltry inch representing the sole advance upon former types. As against this must be set off the fact that the side windows were 8 in. higher and 2 in. broader than those of any previous cars. In 1878 six similar carriages, with luggage compartment and guard's observatory, were constructed in the South Eastern

shops. Though 30 ft. long the new thirds only seated 40 travellers.

It is worth noting that while the modern corridor carriage was thus slowly evolving itself from the omnipresent stage coach, the *first dining car* had already made its appearance in America. This was the "President," which, in 1867, ran in the form of a sleeping car with kitchen attached, on the Great Western Railway of Canada. It was followed by a car exclusively devoted to purposes of refreshment, named, the "Delmonico," which in 1868 was put into service on the Chicago and Alton Railroad.

From 1878 onwards the South Eastern

* They were specially remarkable as being the first six-wheeled third-class rolling-stock ever built by the South Eastern Railway.

3rd class rolling stock began to be very much improved. In 1880 six 43-foot vehicles mounted upon four-wheeled bogie-trucks (fig. 9), were specially built for the London and Suburban "close-coupled" trains. The seating capacity was very large, each car holding 80 persons. Eight slightly smaller carriages, 40 ft. 6 in. in length, with brakes, guard's and luggage compartments, were also put on the line in 1880-81, the whole of the new coaches having been built at Ashford. To some extent, however, a retrogression afterwards began to take place, for the next vehicle constructed proved to be a reversion to the old six-wheeled type of rolling stock. The Ashford works turned out 77 of these coaches between the years 1883 and 1887, supplemented in 1887 by five from the workshops of Messrs. Craven, the latter cars being provided with a guard's compartment and observatory. We append particulars of the 1880 "bogie" stock, and also of the new 6-wheeled cars (fig. 8), for purposes of comparison:—

"BOGIE" 3RD CLASS VEHICLES (1880-81).

Length		Width		Height from centre of buffer to top of roof in centre		No. of Seats	No. of Wheels
6 vehicles				ft.	in.		
43	0	8	4	8	0½	80	8
40	6	"	"	"	"	60	"

6-WHEELED 3RD CLASS (MODERN TYPE, 1883-7).

Length		Width		Height from centre of buffer to top of roof in centre		No. of Seats	No. of Wheels
6 vehicles				ft.	in.		
33	0	8	4	8	0½	60	6

For some considerable time these two types remained unaltered, and it was not until the new era of enlightenment and progress which will for ever be asso-

ciated with the names of Willis and Wainwright dawned upon the South Eastern, that any great advance in the direction of providing more luxurious carriages was made.

It will be as well before turning to the second period of the Company's existence to briefly summarize our results thus far. We find, therefore, that in the year 1887 the Company were in possession of 670 heterogeneous vehicles, representing no fewer than 15 distinct types of 3rd class coaching stock. This fact was in itself a handicap to anything in the nature of sweeping reform, for of course a great number of the vehicles were antiquated



SIX-WHEEL THIRD CLASS LAVATORY CARRIAGE, AS RUN ON THE SOUTH EASTERN RAILWAY BOAT EXPRESSES

and out of date, and it was quite impossible to retire or renovate them all simultaneously, otherwise the line would have been completely denuded of 3rd class carriages. Gradually, however, the old cars have been refitted and rejuvenated, those impossible of regeneration being replaced by really modern rolling stock. The first great reform associated with the Willis-Wainwright *regime* was that of upholstering all 3rd class rolling stock which was of a sufficient size to bear the addition of cushions, without at the same time undergoing too great a corresponding reduction of the space between the seats. This was followed by the building of a number of fine corridor coaches and the

addition of lavatories to many of the existing 3rd class carriages.

Before dealing with the very latest and most modern type of passenger rolling stock now being constructed at the Ashford works, mention must be made of two special 3rd class saloons at present running on the South Eastern. The first forms part of what is known as the "American Car Train," which travels between London and Hastings, and is very similar in construction and appearance to the ordinary American "day coach." It is a very comfortable car, but does not present any strikingly new features.

But the other saloon merits a brief de-

scription. The train in which it runs, "The Folkestone Vestibuled Limited," is at present unquestionably the most beautiful train in the British Isles. The design and decorations reflect no less credit upon the engineering skill of Mr. Wainwright, than upon his splendid artistic taste and judgment. For our part we consider the ornate fittings and harmonious scheme of colour in the carriages of the "Folkestone Limited" infinitely finer than anything to be found in the heavy-gorgeous "Pullman" or "Wagner" cars. The 3rd class coach with which we are more immediately concerned, is divided into a main saloon 33 ft. long, with seating accommodation for 34 passengers, and a

ladies' compartment 7 ft. in length. Both are furnished in wainscoat oak and finely upholstered, being moreover provided with lavatories, heated by steam and lit with electric light. We venture to think that even the most exacting traveller will find little to complain of in these cars. The very newest 3rd class rolling stock consists of eight-wheeled bogie corridor vehicles with lavatory accommodation. It is very doubtful whether any more six-wheeled coaches will be built, and under any circumstances all carriages exceeding 36 ft. in length will in future be of "bogie" design. An exception to the foregoing will, however, be made in the case of

close-coupled suburban trains, for it is not thought desirable to use bogie vehicles in their equipment on account of their great weight, which sometimes entails a difficulty in getting quickly away from the station—a *sine qua non* where suburban



NEW THIRD CLASS BOGIE COACH WITH GUARD'S COMPARTMENT,
SOUTH EASTERN RAILWAY

where suburban traffic is in question. At present the shops at Ashford are absolutely full up with work, and it has been found necessary to invite tenders from outside for five new bogie corridor trains which it is desired to place upon the Chatham section of the "joint lines." These trains also will be electrically lighted. The new Chatham trains will, moreover, be more roomy and better ventilated than any which have been in service upon that line heretofore, and will be fitted with the automatic vacuum brake.*

Several new close coupled trains for the

* Foreshadowed in the RAILWAY MAGAZINE for March 1899, page 285.

Mid-Kent section are also being built, some having, however, been already completed and placed on the line. They consist of 16 vehicles—the 1st class being upholstered in tapestry, the 2nd class in green and black tapestry, and the 3rd class in "railway velvet." They will be illuminated by means of the electric light, which it is also hoped in the near future to apply to the city trains on the London, Chatham and Dover Section also.

Over 1,500 carriages on the South Eastern Railway have gas lighting, but electric light is now used for *all* new stock.

Much new lavatory accommodation has of late been provided on the trains, in

engine hauling the Chatham Company's coaches strikes the onlooker as being somewhat incongruous.

Though not strictly "in the picture," mention must be made of a new and very interesting type of vehicle now being built at Ashford. We refer to a special form of "bogie" invalid saloon. In the RAILWAY MAGAZINE for September last we described a six-wheeled vehicle of this class which was at that time under construction. Since then a very large demand for these carriages seems to have sprung up on all the Southern lines, and as they are very remunerative vehicles to run, an endeavour is being made to as



LATEST TYPE OF SOUTH EASTERN RAILWAY THIRD CLASS BOGIE CARRIAGE FOR MAIN LINE TRAINS

fact, the amount has been trebled during the last five years.

Fifty new bogie corridor carriages have been brought into use during the past six months and a large number are still on order. It is a fact, significant of the advance that has been made, that during the rush of the special Easter traffic the company never once found themselves short of 3rd class accommodation. It is by no means improbable that all the rolling stock of the joint companies will in the near future adopt a uniform livery. This will do much towards giving a symmetrical appearance to the trains; for at present, the spectacle of a South Eastern

quickly as possible supply this unexpected want. These new bogie saloons are really convertible family saloons, and are capable of being used on ordinary occasions as well as for the conveyance of sick folk. They are 38 ft. in length, 11 ft. 10 in. in height from the rails to the top of the centre of the roof and are carried on two four-wheeled bogie trucks.

The internal arrangements are as follows:—At one end there is a luggage compartment 4 ft. 6 in. in length, and adjoining the main saloon, which latter is a roomy and handsomely furnished compartment, containing three couches round a central table and two armchairs in the

further corners. A wide transverse corridor leads to the lavatories, which in turn are placed on each side of a central longitudinal passage opening into the smoking room. This apartment contains five seats of the ordinary 1st class type, but is more than ordinarily spacious, being 7 ft. 6 in. in width from the door of the corridor to the back of the opposite seat.

As we have said, these carriages have leaped into instant and extraordinary popularity, and it has now become necessary to quadruple the number. All bogie carriages over 50 feet in length are fitted with Wainwright's special compensating buffer arrangement.

It will be seen from the foregoing that the rolling stock of the amalgamated companies bids fair to ere long approximate to the standard of that of the best lines in England. The passenger vehicles of a company cannot be revolutionised in a day nor yet in a year, but there is already a most hopeful promise of better things to come. Taking into account the very large number of 3rd class vehicles owned by the South Eastern Railway compared with other railways with a very

much larger mileage, the proportion of old 3rd class carriages on the South Eastern is really very small. This point should be specially taken into consideration when making comparisons. One thing at least is certain. In Mr. Harry S. Wainwright, the genial and energetic Locomotive and Carriage Superintendent of the Joint Companies, they have got the right man in the right place. He has accomplished wonders in the past, and out of most unpromising materials has often produced remarkable results.

All well-wishers of British trade will rejoice to hear that he is a firm believer in the excellence of British workmanship, and in its superiority over that of America or of any foreign country. They may therefore rest assured that no contracts for work will leave England which can possibly be executed at home.

It is our pleasant duty to once more thank Mr. Wainwright for most courteously placing at our disposal all the information which was necessary to enable us to write this article.

The photos were specially taken for the RAILWAY MAGAZINE.



HOW A RAILWAY CIRCUMVENTED THE LAWYERS!

(A True Railway Narrative)

BY W. BEDDOES

Traffic Superintendent, Waterford, Limerick and Western Railway



It is not often a railway gets so deeply into the meshes of the law as to be in the hands of the bailiffs, although when in the United States—down South—I had the unique experience of seeing a man who had a decree against one of the Florida railways for a considerable sum, come up, with the limbs of the law, to a railway station and seize a train, fastening the locomotive by chain and padlock to one of the pillars of the platform. The money was promptly forthcoming, and the train set free.

Some years ago, when Mr. Frank Beddoes (master of the United Pack of Foxhounds), living at Longville, Salop, died, the settlement of his estates came into the hands of the family lawyers. The Bishops Castle Railway

ran through his land, for which he had never been paid, and, being a liberal-minded landowner, had allowed things to slide, taking the broad view that the railway was a public convenience, and the loss to him of a few acres of land not much one way or another.

When he was gone the lawyers thought differently—as I suppose they had a right to do—and were not long in closing on the railway, and getting a judgment for payment or possession. The money not being forthcoming, the bailiffs swooped down on the railway near the village of Horderley, Shropshire; and, after taking out a couple of rails and so blocking the

line, sat down on the embankment, lit their pipes, and waited developments.

And so matters continued for a week or ten days, with famine staring Bishops Castle in the face, coal at



THE JUNCTION OF THE BISHOPS CASTLE RAILWAY WITH THE LONDON AND NORTH WESTERN AND GREAT WESTERN JOINT RAILWAY AT CRAVEN ARMS

starvation prices, and things generally looking blue in the district served by the line. To make matters worse, there were a lot of London and North Western railway wagons blocked in, about which the usual "wire" and confirmatory letter came from the rolling-stock superintendent at Stafford, every morning as regularly as the sun arose, requiring to know when they would be released and put into work. But bailiffs are not shunted and rails put in by wire, and so it came to pass that as things were growing desperate, a certain coal

busy, and everything for the Bishops Castle road found to be ready coupled-up in the "long siding"; and by a strange coincidence, too, the day signalman, who ought to have been taking his rest (as per Board of Trade regulations) comfortably in bed—while the junction was closed for the night—was hanging about in the vicinity of his cabin, no one seemed to know why. In the meantime—for consideration received—a couple of rustics, who casually crossed the line hard by where the faithful bums were keeping vigil over the vacant spaces in the iron road, commiserated with



A "MIXED" TRAIN, BISHOPS CASTLE RAILWAY, LEAVING STOKESAY STATION FOR BISHOPS CASTLE

them on their cold and lonely job, and suggested a visit to the village pub., where a gallon or two of mulled beer, tempered with a drop of gin and served out before a good blazing fire would make them comfortable for the night. Everything was quiet, no likelihood of "them railway chaps" being about at that hour on a cold dark night; the temptation was strong, it would not take long to get a drop o' beer and a warm, so in peace they all departed.

They were soon in the chimney corner of the "Lion Inn," no lack of beer, and something to warm it; time sped on, an hour or two passed merrily, and everybody jovial and in good humour. I think Young, in his "Night Thoughts," says: "The clock strikes twelve, we take no note of time!" This is just what the bailiffs did, or did not do. Again, an older authority than Young, speaking of strong drink says: "Whosoever is deceived thereby is not wise." This fits the bailiffs again, for is there not on the midnight air a sound of a puffing locomotive? Sure enough. To make a long story

merchant, now dead and gone—some of whose trucks were also in pawn—called a secret council of war in the back parlour of the well-known hostelry at "Craven Arms," where the London stage coaches used to call, or ever the Shrewsbury and Hereford line was made. And had he not a right to be chairman, seeing that he had previously annexed one of the daughters of the house? Who attended the conclave, and what transpired, I am unable to divulge, except that they sampled the best whiskey in the cellar. Sufficient to say, in the shadows of that self-same evening the shunting engine was unusually

They were soon in the chimney corner of the "Lion Inn," no lack of beer, and something to warm it; time sped on, an hour or two passed merrily, and everybody jovial and in good humour. I think Young, in his "Night Thoughts," says: "The clock strikes twelve, we take no note of time!" This is just what the bailiffs did, or did not do. Again, an older authority than Young, speaking of strong drink says: "Whosoever is deceived thereby is not wise." This fits the bailiffs again, for is there not on the midnight air a sound of a puffing locomotive? Sure enough. To make a long story

short, the bums had scarcely entered the "Lion" when a gang of men, by the aid of dark lanterns, had placed the rails back in position; soon after, an engine with all the empties crept quietly down from Bishops Castle into Craven Arms, picked up a train load of goods and coal, and, with

stop the train as she sped by, but repentance came too late. They were outwitted, and although the lawyers threatened the manager with arrest, he was able to prove an alibi; and terms being subsequently arranged the rails were not again removed, things went on smoothly thereafter, and



THE LINE BETWEEN PLOWDEN AND LYDHAM HEATH ON THE BISHOPS CASTLE RAILWAY
AFTER THE FLOODS OF 13 MAY 1886

a good shove from the London and North Western shunting engine, steamed off as hard as she could pelt for the beleaguered town.

Our friends, the bailiffs, were sufficiently awake to hear the snort of the engine, and reeling out of the "Lion," shouting and waving their lanterns, tried in vain to

once more the little Bishops Castle railway was allowed to pursue the even tenour of its way, unmolested by the myrmidons of the law, and the British public appreciated the advantage of again being able to get from Bishops Castle to Craven Arms for one shilling instead of hiring a road conveyance for half a sovereign.



PERTINENT PARAGRAPHS

"Railways have rendered more services, and have received less gratitude, than any other institution in the country."—JOHN BRIGHT.



OUR colour printer has disappointed us, and therefore we are unable to present with this issue of the RAILWAY MAGAZINE the coloured plate of the Lancashire and Yorkshire

Railway Locomotive No. 1,400, as we hoped to do.

Great pains are being taken to make the plate correct in colouring and accurate in every detail; and, with the July issue, readers may rely upon having presented to them the coloured plate of the Lancashire and Yorkshire Railway engine.

We also have to direct the attention of the readers of the RAILWAY MAGAZINE to

AN IMPORTANT NEW DEPARTURE.

* * *

Encouraged by the success which has attended the RAILWAY MAGAZINE during the two years it has been before the public, the proprietors have decided to present gratis with each issue a coloured plate of one of the latest types of British locomotives, together with a full description and dimensions of the engine illustrated, month by month. We hope RAILWAY MAGAZINE readers will make this unique offer widely known among their friends, and so enable them to obtain a series of exactly correct coloured pictures of our locomotives. The coloured plate for August will be Mr. F. W. Webb's 4-cylinder London and North-Western Railway express locomotive "Black Prince."

* * *

It will no doubt interest RAILWAY MAGAZINE readers to be reminded that not

only in this country, but also abroad, the RAILWAY MAGAZINE is recognised as the organ of the railway companies. On the question of automatic couplings, the railroad publication with the largest circulation in the United States, reproduces our remarks as representing the opinions of "the official shareholding class."

* * *

Railway Managers who have already experienced more than enough trouble with regard to workmen's trains and cheap fares, must be delighted with the decision of the Commons Committee to strike out of the South Eastern and London, Chatham and Dover Railway bill, the clause making it necessary for people applying for workmen's tickets to produce their card of membership of a trade's union. Had such a proposal been accepted, it would simply mean that every working man would have been compelled to join one of these arbitrary and mischievous combinations, to enable him to travel at the special fare. The clause, in fact, made concessions to men because they were trade unionists, and not because they were working men—very different species of human beings. However, the advantage has been obtained for the working man and not for the trade unionist.

* * *

A Parliamentary Committee has passed the preamble of the bill for a joint Great Central and Great Western Railway, by means of which the former line will obtain independent access to London—that is, access independent of the Metropolitan. But as the new line is to be a joint railway, complications may at any time arise concerning its working, when constructed. Considering the mutual obligations of the

Metropolitan and Great Central Railways to each other it is unfortunate that they cannot work amicably together, and so save the expenditure of an enormous sum of additional capital that must be provided for the construction of the new joint railway.

* * *

With the success of the working union of the South Eastern and London, Chatham and Dover Railways before them, it ought not to be difficult for those responsible for the management of the Great Central and Metropolitan Railways to come to some kind of an arrangement whereby the separate interests of the two railways could be adequately preserved, and yet the two systems worked under one management.

* * *

Complete amalgamation is not impossible, providing a willing spirit is exhibited on both sides; the Great Central would by such means obtain the local and suburban traffic that it seeks. Or, as another alternate proposal, we suggest that the Great Central purchase either the Metropolitan Extension, north of Neasden, which would give the Great Central Railway an independent line throughout, whilst the Metropolitan would still retain its suburban (as apart from country traffic) on the St. John's Wood branch. Or the Metropolitan might be willing to relinquish the whole of the railway from Baker Street northward, and then the Great Central would have four lines between Marylebone and Neasden, and further extensions would not be required for several years.

* * *

The above are only suggestions on our part, and are in no way inspired, but every impartial observer of the state of affairs arising out of the present strained relations must admit that it should not be very difficult even now to make an arrangement satisfactory to everyone concerned, provided personal feelings are eliminated from the discussion, and the "greatest good for the greatest number" (the shareholders) is the attainment sought for. When the Act for the joint line from Grendon Underwood to Neasden has been obtained, the Great Central has still to find the money necessary to construct its moiety.

A United States Railroad official writes us an interesting letter concerning the purchasing of locomotives by English Railway Companies in the United States. His letter contains a good many pertinent remarks that Englishmen will do well to take to heart. He says:

"I have seen lately in the newspaper here, in a very prominent place, the information that two English Railways have purchased American locomotives—one, the Midland Company, has placed a second order; the comments of the American press thereon are anything but complimentary to British locomotive builders.

"Recently you had a paragraph in your magazine that a prominent shipbuilding firm in London could add locomotives to their list of productions. I am sure it would be a success, judging by their war vessels. London would be a convenient manufacturing place for home railways, also for shipment; undoubtedly, if England desires to export, she will have to build engines on the American plan as well as on the English models; in fact, American makers have nearly a monopoly of the Foreign and British Colonial Market, thereby rapidly displacing English makes—for instance, the 'London,' 'Cape,' 'Egypt,' 'Australia,' 'Canada,' 'India,' 'Japan,' 'China,' 'South America,' 'West Indian Islands,' and even 'Finland,' are using 'Baldwins,' 'Rogers' and 'Schnectady' engines. Naturally an Englishman asks the cause of this loss to British manufacturers. I believe one principal reason is, that the British Railway Companies give but a small number of orders to locomotive builders, but build their own, and each locomotive superintendent has his own ideas, thereby causing a multiplicity of designs, whereas in this country practically all railroads buy their locomotives from builders, and, of course, thousands are built, like bricks, all the same, the different parts being 'Standard' and kept in stock. Being made in large quantities, can be produced economically and shipped on demand; a 'Machine' can be assembled in very quick time. Unless something is done, these recent orders obtained from purely English Railways will influence the very few Companies abroad—now buying in England—to buy their Rolling Stock in America, and the exports in a few years will be 'Nil.' It is evident that Railway Companies do not construct their Rolling Stock, neither as cheap or useful, as a large and well-equipped Company, with smart and progressive managers at its head. They might as well construct the new lines under their own departments, instead of contracting for same. If British investors were to put their money into home industries that have opportunities of making good returns and giving employment to many workmen, it would be much more profitable, and your ships would also have cargoes outbound instead of 'Water' ballast, as at present, in a great number of cases; 80% that come here for cotton, logs, corn, etc., arrive in ballast; but mines in 'Alaska,' 'Klondike' and 'Mexico,' and anything abroad, glaringly advertised by some slick 'Yankee' promoter, that cannot be disposed of at home here, are easily palmed off upon the innocent British investor looking for 8% or 10%, who very soon finds, alas, that big dividends carry with them big risks.

"Cannot you agitate the question through your

'Pertinent Paragraphs' column? The RAILWAY MAGAZINE circulates through official circles, and any suggestions made by you I am sure would have great weight, everything points to a need in Great Britain of more powerful engines."

* * *

As we pointed out in our February number, there is at present an undoubted opening for a large locomotive building concern in this country, and there is also any amount of capital awaiting employment. Unfortunately, the Trade Union agitators have, by their senseless speeches, made British capitalists nervous of laying out their money for the purpose of erecting new engineering works, properly equipped with modern machines. Nor can the capitalists be blamed for their caution in the matter. It is a serious thing to them that a million of money so expended, and capable of giving employment to thousands of men at good wages, should be at the mercy of self-seeking agitators, whose whole energy is employed in stirring up strife between masters and men. Meanwhile our trade is gradually, but surely, being obtained by foreign manufacturers, who do business under more favourable economic conditions than obtain here. Orders for locomotives for various British railways continue to go to the United States, the Port Talbot and Great Central Railway having followed the example of the Midland, Great Northern, and Barry Railways by placing orders in America.

* * *

This "follow-my-leader" policy of some of our railways can be summed up in Lord Dundreary's words, for certainly "no fellow can understand" that because one railway buys engines in America it should be necessary for others to do likewise. Surely such an unusual action on the part of the initiator of the movement ought to have acted as a stimulus to the other companies to show, not only their independence and wealth of alternate resources, but their patriotism also. There is, however, in railway politics an imitative trait that, happily, does not obtain in any other business circle in this country; as witness the general adoption of large initial letters on locomotive tenders and goods wagons, the construction of additional platforms at the London termini of the Northern railways, and—the ordering of locomotives

in America. An inferior tradesman closely copies the successful methods of a competitor in the hope that thereby his wares will be mistaken for those of his widely-known rival. Powerful railways have no need to adopt such methods. Fancy the Aerated Bread Company fitting up its depots in a certain garish style because a Hebrew rival affects a gaudy method of decoration!

* * *

The *Railway Herald* for May 6th, under the caption "American Competition in Locomotive Building," has a very instructive article on the subject, and readers interested in the question of the supply of locomotives would do well to peruse the article in our contemporary.

* * *

We understand that Mr. J. H. Stafford, the able and much respected General Manager of the Lancashire and Yorkshire Railway Company, has decided to retire from the position at the close of the present half-year. Fifty years ago Mr. Stafford entered the service of the Lancashire and Yorkshire Railway Company as a junior assistant in the Secretary's department. Step by step he moved upwards until, in 1875, he succeeded Mr. Lawn as Secretary, a position which he held for fifteen years, when the retirement of Mr. Thorley paved the way to the higher post, which he is shortly to resign. It is rumoured that the Lancashire and Yorkshire Railway Directors, as is also the case when a successor to Sir J. Thomson of the Caledonian has to be appointed, will appoint one of their own officers to fill the General Manager's chair.

* * *

It is of interest to note that two years before Mr. Stafford entered the Lancashire and Yorkshire Railway service, the old Manchester and Leeds Railway became merged in the more imposing title of the Lancashire and Yorkshire Railway Company. Its running powers, roughly speaking, extended over about 50 miles, and it is a somewhat curious circumstance that while Leeds was then its terminus in Yorkshire, the present line, though it has spread itself over a vast area in the two counties, only enables the Company's trains to reach Leeds by

the exercise of running powers over the Great Northern system from Bowling Junction. The total length of the line last year was 557½ miles, as compared with 50 in 1849, and if we take the circle of 10 or 12 miles round Manchester, the Lancashire and Yorkshire Railway of to day serves a population of nearly 5,000,000 persons.

* * *

In a recently issued—but as usual, much-belated—report of one of the Military Inspectors of the Board of Trade, upon the derailment of a train, the Inspector suggests that the accident resulted from the use of a certain type of tank engine—the four-coupled in front with a trailing bogie. It would be interesting to learn the reason for such a conclusion; the military officer hints that he arrived at his decision because an engine of the same type had upon a previous occasion left the metals. Such a mishap is not at all surprising, seeing that the large majority of tank engines are of the four-coupled in front, with a trailing bogie type. Nor are cases unknown of other types of tank-engines running off the road.

* * *

The type of locomotive condemned by the Inspector is to be found on almost every British railway; and on several lines, such as the South Eastern, Midland, London, Chatham and Dover, and Cambrian, the design is used exclusively for passenger trains when tank-engines are employed. The majority of passenger tank-engines on the Caledonian, Great Eastern, Great Northern, London and South Western, and London, Brighton and South Coast, are also of the same type, whilst the type is also to be found on the Great Western and several minor railways. It is evident that, excluding the London and North Western, which has no bogie engines, and can therefore be left out of the present calculation, a very large proportion of the train miles performed by tank-engines is run by engines with four-coupled wheels and a trailing bogie; and, therefore, by the law of average, one expects a preponderance of derailments to happen to such engines. If, however, the train mileage were arranged under two headings, (a) that performed by four-

coupled in front tanks, and (b) that performed by all other designs of passenger tank-engines, and the total of each class, divided by the number of engines performing the journeys, we have no doubt that the number of miles per derailment for each type would be some thousands in favour of the four-coupled in front with a trailing bogie design. It appears to us, therefore, as if the Board of Trade Inspector had not fully considered the whole of the aspects of the case when arriving at his decision.

* * *

Again, the officer states, that these engines are only unsafe when running chimney in front; but, if this is correct, for the same reason tank-engines, like those in use on the Metropolitan and Metropolitan District, and other railways that have a leading bogie and four-coupled trailing wheels, must be unsafe when running bunker first. But all tank-engines run as frequently bunker as chimney first; therefore, taking the enormous mileage performed by the engines of the Metropolitan and Metropolitan District Railways, we should expect frequent reports of these engines leaving the metals, especially as the curves are numerous and of short radius; such mishaps are, however, very uncommon. Then, again, what about the numerous six-wheel tank-engines, with a rigid wheel base? These engines are common on the Great Western, London, Brighton and South Coast, Great Eastern, and other lines; they also (according to the Military Officer's reasoning) must be more unsafe than the class of engines he condemns. We can only repeat that we fear that the gentleman arrived at his conclusion without fully taking into consideration the whole of the circumstances connected with the case. But we have written sufficient to show that instead of the Inspector arriving at a logical conclusion from his premises, the result is a *reductio ad absurdum*.

* * *

Readers of the RAILWAY MAGAZINE will be gratified to learn that still another of the proposals, which we from time to time suggest for the amelioration of the railway services, has been adopted by the railways concerned. In the issue of the

RAILWAY MAGAZINE for December 1898, under the title of the "Great Southern Railway," we proposed the running of a new "coast-line express" connecting the coast towns between Margate and Portsmouth by a through fast train, with a possible extension to other places West of Portsmouth. Commencing May 1st, Mr. Gooday, who is doing so much to improve the train services of the London, Brighton and South Coast Railway, adopted the suggestion (so far as the railway he manages is concerned), by running a through fast train between Hastings and Portsmouth, and *vice versa*. The centre link having been provided, it remained for Mr. Owens and Mr. Willis to complete our suggestion. It is needless to add that such capable railway managers (as these gentlemen have abundantly proved themselves to be) immediately took the necessary steps to provide the continuation of the coast-line express services, west and east of the London, Brighton and South Coast Railway system, and from 1st July the express will run in each direction between Margate and Bournemouth (and probably Plymouth).

* * *

The details as to the times and timing have yet to be arranged, and we sincerely trust that the speed of the trains will be quite up to the modern standard of express trains; for instance, Portsmouth ought to be brought within a four hours' railway journey of Margate; and the continuation westward of the dockyard town should be at the same rate of speed. Unless a rate of travelling approximating to that we indicate is maintained, we fear a good deal of the wisdom displayed in carrying out an excellent service will be labour in vain, as, unless the train services along the South Coast are performed at a considerable saving upon the present times, tourists and holidaymakers will prefer to travel by the pleasure steamers that during the summer ply along the South Coast, when making trips to towns adjacent to the places at which they may be staying. The adoption of this and other

suggestions of ours by the railways must be as gratifying to the readers of the RAILWAY MAGAZINE—who are, in fact, the intelligent travelling public of the country, and can, therefore, appreciate such improvements—as it is to ourselves. We do not make suggestions for improvements in railway working, unless, from experience, we are thoroughly satisfied of the practicability and utility of the same, hence the absence from our columns of the many harebrained (so-called) railway improvements that are proposed in other publications.

* * *

Mr. W. F. Pettigrew, the Locomotive Superintendent of the Furness Railway, calls our attention to a slip in the Review of his "Manual of Locomotive Engineering," which appeared in our April issue. The statement that Mr. Pettigrew was the Locomotive Superintendent of the London and South Western Railway in everything but name, and that to him belonged the merit of designing the last class of outside cylinder express engines for that railway, goes beyond the actual facts. Mr. Pettigrew was, at the time, Works Manager at Nine Elms, and therefore was, as principal assistant to Mr. Adams, the then Locomotive Superintendent, closely concerned in the construction of these engines, but Mr. Adams was responsible for the design in question. We highly appreciate Mr. Pettigrew's generosity and sense of fairness in calling our attention to the matter.

* * *

We are aware that engine drivers treat their locomotives as human beings, and from the following it appears as if the superior officials on a Continental railway do the same:—

"About a hundred yards from Monseron, a little railway station on the Franco-Belgian frontier, may be seen a printed notice, '*Locomotives are requested to whistle twice for Tournai and three times for Courtrai.*'"

It is a fact that every locomotive that reads the notice immediately whistles as requested!

GREAT NORTHERN MANCHESTER SERVICES— OLD AND NEW

BY CHARLES ROUS-MARTEN

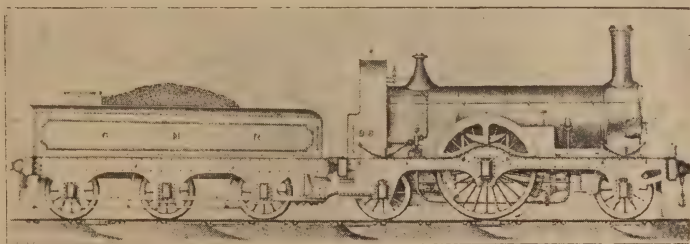


It was in the summer of 1857—nearly forty-two years ago—that the Great Northern Railway first established, in connection with the Manchester, Sheffield and Lincolnshire, now the Great Central Railway, a definite service of express through trains between London and Manchester.

The Fine Arts Exhibition of that year was the motive power. Previously the London-Manchester traffic had been a private preserve of the London and North Western, just as it perhaps might be still if that Company were to seize the full advantage of its strong position in possessing a much shorter and easier road than that of any of its rivals. But when a special flood of profitable passenger traffic was suddenly let loose by the Manchester Art Exhibition, the Great Northern did not see why it should not try for at least some share of it. And so, undismayed by the drawback of having 20 miles farther to go than had the London and North Western by its shortest route and far steeper grades throughout, the Great Northern and Manchester, Sheffield and Lincolnshire boldly announced a new service of trains between the two cities, a fast express leaving each terminus in the morning, and another in the evening. The departure

times from King's Cross were 10 a.m. and 5 p.m.

At first the transit time was 5 hr. 20 min. Even this involved some very smart work over the Great Northern part of the journey, King's Cross to Retford, and particularly on the length from London to Peterborough. The first stop was at Hitchin, 32 miles, the time allowed being 40 minutes, representing an average speed of 48 miles an hour. For the next length, 44½ miles, Hitchin to Peterborough,



A "CONVERTED CRAMPTON," USED IN GREAT NORTHERN RAILWAY
MANCHESTER SERVICES, 1857—1861

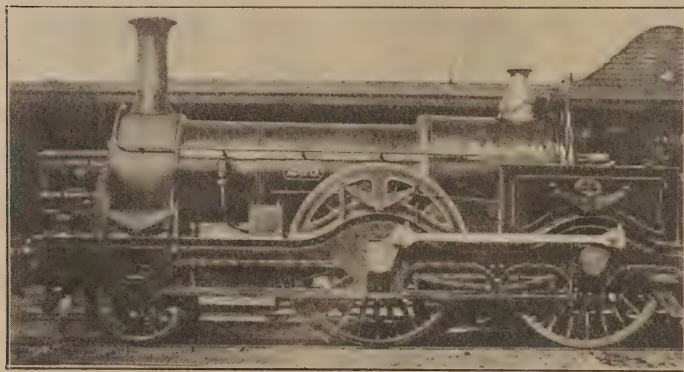
the booked time was 58 minutes, or at a fraction over 45 miles an hour. These were the same times as those at which the Scottish express had been booked for some years previously.

But the London and North Western accelerated, and the allied Companies promptly followed suit, cutting down the time to five hours, and knocking off five minutes of the already fast timing between London and Peterborough. That is to say, the run of 76½ miles was booked to be done in 95 minutes, with a two minutes stop at Hitchin, or 93 minutes actual

travelling time. The allowance for the first 32 miles to Hitchin, was reduced to 38 minutes, representing an average of 50·5 miles an hour. This, I believe, was the first genuine case of a booked speed of over 50 miles an hour on the standard gauge, at any rate of such a speed being deliberately prescribed. And I may point out that we have had no timing anything like so quick from King's Cross to Hitchin for many years past. At the present day we have nothing faster than 42 minutes from start to stop, and that is always found a tough job with a heavy load. In 1857 the loads of course were light, but it is creditable to Mr. Sturrock's

and Manchester, Sheffield and Lincolnshire gradually reduced the transit time. The fast trains made the journey successively in 4 hours 55 minutes, 4 hours 50 minutes, 4 hours 45 minutes, and by 1883 the time had been cut down to 4½ hours by two trains each way daily. In the following year, 1884, the high-water mark of the joint express service between King's Cross and Manchester was reached. In July of that year the two o'clock expresses from London and Manchester respectively were booked to make the journey each way in 4 hours 15 minutes, equal to the best of the London and North Western and Midland. For 14 years

7 months and 14 days this remained the best time between the two cities by the Great Northern route. It was the best by all routes until last autumn, when the London and North Western gave a connection with the Irish day mail, and by that train lowered the time from London by 5 minutes, viz., to 4 hours 10 minutes. But the Midland added 5 minutes to its best



STURROCK'S LAST TYPE OF COUPLED ENGINES FOR THE GREAT NORTHERN RAILWAY

engines that they proved themselves able to average speeds so high, on a road by no means easy, at such an early period of locomotive history. The next run, Hitchin to Peterborough, was allowed 55 minutes for the 44½ miles, *i.e.*, at a fraction over 48 miles an hour. And the engines actually kept time at these fast bookings. It will be observed that while the average rate from London to Peterborough was 48·2 miles an hour, including stoppages, that from Peterborough to Manchester was only 38·1. I have therefore restricted my analysis to the quicker length, as my space will not permit an exhaustive description.

As years rolled on, the Great Northern

time, in spite of its shorter distance, and so the Great Northern route held the intermediate place between the two, so far as quickest time was concerned. But on the 15th of March 1899, all this was changed "in a moment, in the twinkling of an eye"!

Those former Great Northern Manchester expresses in the late fifties and early sixties were run by (a) the "Converted Cramptons," Nos. 91-99; (b) the "Large Hawthorns," Nos. 203-14; or (c) the "Jenny Linds," Nos. 201, 202. Of these (a) and (b) had 6 feet 6 inches single driving wheels, and cylinders (a)—as rebuilt—and (b) from the first, 16 by 22; (c) had 6 feet single drivers and—as

rebuilt—cylinders 16 by 20. So, at least, I was informed by a friend who long held a responsible position on the locomotive staff of the Great Northern. I have seen the dimensions differently stated, but I believe the above figures to be correct. Subsequently Mr. Sturrock's latest singles, Nos. 229-240, with 7 feet wheels and cylinders (originally) 17 by 22 (but as rebuilt by Mr. Stirling 17 by 24) came on the scene, and then his latest coupled type, Nos. 264-269, which had 7 feet wheels and 17 by 24 cylinders. It was alleged of these handsome locomotives, I do not know with what truth, that they "could not keep their side rods on," that is to say, they broke or bent them, or even flung them off. I never travelled with them while they were coupled, but a friend showed me his notes of the single journey he made behind one of the class. Curiously enough, she did bend her side rods on that occasion, and had to complete her

trip as a single. All six were converted into singles by Mr. Stirling when he took charge at Doncaster, and they are still doing good work. A few years ago they were sentenced to be branded "A," the symbol of doom, and two new 8 feet wheelers were actually built, bearing the numbers 264 and 265; but upon re-examination Mr. Stirling relented, finding, as he himself told me, that they were good for some years yet; and the new locomotives were re-numbered 1001 and 1002. In 1867 came Mr. Stirling's 7 feet singles—virtually enlarged "Jenny Linds"—with cylinders 17½ by 24, very admirable engines, which still do capital work. One of these, No. 215, often ran the Manchester express in 1884 and 1885, even after it had been accelerated to the highest point of speed it has

ever reached. But when the 8 feet singles became fairly numerous, they took their share of the Manchester express duty, as did also the 7 feet 6 inch single-wheelers after they began to arrive in 1886. These two classes last named still run virtually all the best Manchester expresses, including those about to be more specially noticed, which go over the new route, via Nottingham, at least they take those trains between London and Nottingham.

As for the running of those 4½ hour expresses, it has always been the admiration of the railway traveller. The Great Northern runs of 105½ miles each way between London and Grantham usually occupied only 115 to 117 minutes. Then the Manchester, Sheffield and Lincoln-

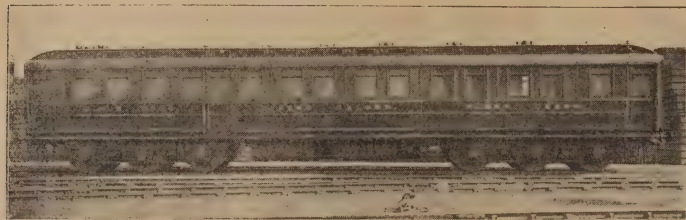


STIRLING'S FIRST TYPE OF "SINGLE" EXPRESS ENGINES WHICH HAULED
THE GREAT NORTHERN MANCHESTER TRAINS, 1867-1870

shire covered the 56½ miles between Grantham and Sheffield in 61 to 63 minutes, and the steep and tortuous 41¼ between Sheffield and Manchester in 55 to 59. Thus a 4 hour service has always been quite "within the region of practical politics" had it suited those politics that it should be offered. But it didn't! The work done, however, was often very fine. I have arrived at Manchester at 6.9 by the 2 p.m. from King's Cross, and have been half across the City before the clocks struck 6.15, the booked time of arrival. And the up train almost invariably reached London several minutes early. It was a splendid service! But it is gone, and the place thereof knows it no more!

When it became known that a part of

the "consideration" demanded and obtained by the Great Northern for relinquishing opposition to the London Extension Bill of the Great Central Railway was access to Manchester with



FIRST CLASS DINING CAR FOR THE GREAT NORTHERN RAILWAY
NEW MANCHESTER EXPRESSES

its own engines and coaches, and that this might be *via* Nottingham or *via* Retford at the option of the Great Northern, many of us feared that "things" might happen. They have happened!

In the first place those two splendid $4\frac{1}{4}$ hours services—one each way—have gone by the board. The Great Northern running powers do not admit the trains to the nearest Manchester station, London Road, and so the Great Northern trains have not only to go 5 miles farther, to the Central Station, of which the Great Northern, Midland, and Great Central Companies are joint owners, but have also to grapple with the difficulties and delays of a circuitous road swarming with junctions and stations and sidings, and every other potentiality of obstruction.

Consequently while the fast time of 3 hr. 9 min. from King's Cross to Sheffield is still retained in the new time-tables, the remainder of the journey to Manchester shows a woeful falling off, the total allowance from London to Manchester still *via* Retford being 4 hrs. 32 min. instead of 4 hr. 15 min. This is beaten by the 4.15 p.m. down train, to the extent of 2 minutes, that train, by dropping the Stockport stop, being due at Manchester, also *via* Retford, in $4\frac{1}{2}$ hours.

By the "new route," i.e., *via* Nottingham, the quickest time allowed for the

crack express, that leaving King's Cross at 9.20 a.m., is 4 hr. 40 minutes. This train is timed to make the first run, viz., to Nottingham, in 2 hr. 27 min. for the $127\frac{3}{4}$ miles. This is the longest Great

Northern run without stop yet shown in Bradshaw, the longest hitherto having been that between King's Cross and Newark, 120 miles, by the summer midday Anglo-Scottish diner. The King's Cross-Nottingham run has, however, been frequently

done without a stop by special trains to Nottingham races. The actual allowance from London to Nottingham is 4 minutes longer than the Midland's best (2 hr. 23 min.), but the Great Northern, having 4 miles farther to go, has a fractional superiority in point of booked speed, viz., 52.1 miles an hour as against 51.9. The 5.30 is allowed 4 hr. 44 min. *via* Nottingham.

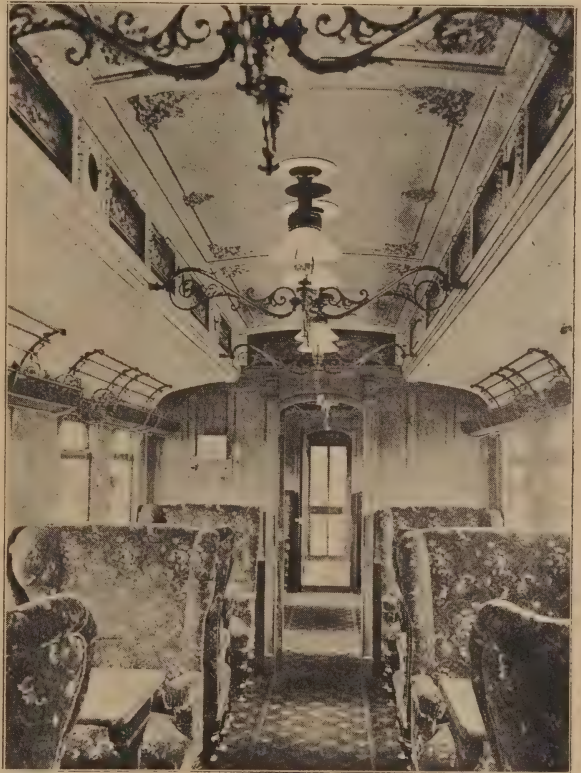
All the up trains travel by the new route *via* Nottingham. The best is the 10 a.m. diner from Manchester, which is timed to reach King's Cross in $4\frac{3}{4}$ hours, viz., at 2.45 p.m., being allowed 1 hr. 58 min. for the final run of $105\frac{1}{2}$ miles from Grantham, or at the average rate of 53.5 miles an hour. But the famous 2 p.m. train, of 14 years' celebrity, is quite spoiled. It leaves 5 minutes later and gets to London 43 minutes later, the official arrival time being 6.58 and not "6.55" as appears in the advertisements, in the passenger time-tables, and in "Bradshaw." The final run from Grantham is thus allowed 2 hr. 2 min., not 1 hr. 59 min. as would appear from the ordinary tables. No train is run from Nottingham to King's Cross without a stop. The 5 p.m. diner from Manchester is allowed 4 hr. 55 min. to London.

It is understood that these timings are to undergo considerable acceleration on

1st July, when the new services on both the Great Northern and Great Central shall have settled down into regular working order, and when the newer parts of the latter line shall be deemed sufficiently consolidated for the highest speeds to be run. Meanwhile, of course, I must take the service as I find it. That the Great Northern is unavoidably much handicapped by having to run 214 miles—*via* Nottingham to Manchester Central—instead of 203, as when the service was performed in association with the Great Central, *via* Retford to London Road, is manifestly undeniable. But a more serious handicap is the obstruction met with after the Great Central line has been entered upon, the trains encountering such frequent blockings that in my experience, and in that of others too, there is almost always a loss of time by the best expresses to the extent of from 20 to 40 minutes between the termini, and this in spite of some very fine running by the Great Northern engines. I do not attempt to allocate the blame for these delays; it is no part of my function to do so. I merely record, as a faithful chronicler, a fact which I greatly deplore, and express an earnest hope that some satisfactory arrangement may soon be arrived at as to right of precedence. It is a sad pity to see good runs spoiled by repeated signal stops, and unless this can be averted, even the hoped-for acceleration in July will not materially mend matters.

Of the new route itself little needs to be said, since its absolute novelty is limited to the short connecting line which shunts the Great Northern train on to the Great Central line at Weekday-Cross Junction. For the rest, the trains follow the familiar Great Northern route to Nottingham, *via* Grantham, but stop at the

"New London Road" Station, which the Great Northern has built in the very heart of the lace city. From Nottingham it follows the new Great Central line—much of which, however, has long been in use by local and coal trains—and joins the old Great Central main line from Retford at a point near Woodhouse, proceeding thence *via* Sheffield and Penistone to Godley, and then turning off to Woodley, Stockport and Manchester Central, the last few miles of the journey being side by side with the Midland's express route to Manchester. It will not be necessary, therefore, to set forth in detail the various gradients, those of the Great Northern and older Great

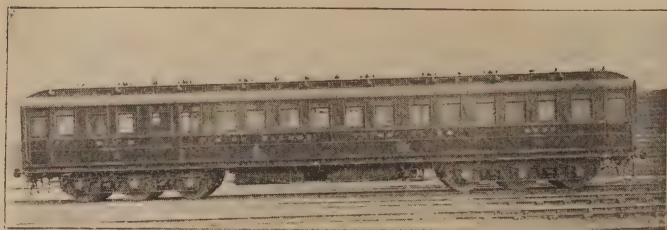


INTERIOR OF NEW FIRST CLASS DINING CAR, MANCHESTER SERVICE, GREAT NORTHERN RAILWAY

Central being familiar to all railway readers, while those of the new portion of the Great Central were given in

the April number of the RAILWAY MAGAZINE.

Neither is it necessary to describe the well-known engines which perform the service, as this was done very fully in my



THIRD CLASS DINING CAR FOR THE GREAT NORTHERN NEW MANCHESTER SERVICE

article upon New Great Northern Engines, which appeared in the January number of this Magazine. The fresh coaching stock specially built for the service I shall deal with later. Meanwhile I proceed to recount my own experience of the new service.

My first expedition was in the 9.20 a.m. train from King's Cross. We had the normal load—viz., five corridor bogie vehicles—of which two were twelve-wheelers and three eight-wheelers, a total weight of about 150 tons, behind the tender. The engine was No. 774, one of the late Mr. Stirling's 8 ft. singles, driven by Watson, one of the good old-school of Great Northern drivers. The weather was all that could be desired at first, but later became windy and showery.

Starting with absolute punctuality, we soon made good progress, passing Potter's Bar summit in $18\frac{1}{4}$ min., and Stevenage ($28\frac{1}{2}$ miles) in 34 min. 40 sec. Directly afterward, however, we encountered a very bad slack for relaying, which cost us over 2 min., in spite of which we reached Hitchin (32) in 38 min. 51 sec. from King's Cross. The usual swift run followed over the easy length of $26\frac{3}{4}$ miles to Huntingdon, which was covered in 24 min. 9 sec., Huntingdon ($58\frac{3}{4}$ miles) being passed in exactly 63 min. from the start, or in 61 min. net. We climbed the

Abbott's Ripton bank of 1 in 200 at a minimum rate of 48 miles an hour, and were slackened by signals almost to a dead stop just outside Peterborough Station (76 miles) in 80 min. 21 sec. gross, or $78\frac{1}{4}$ min. net, an extremely smart performance. We had, however, to pay the penalty for anticipating our booked time, for after crawling through Peterborough Station at 10.41.44, we encountered three bad signal slacks in succession, in each case to about 10 miles an hour, so

that we took as much as $14\frac{3}{4}$ min. to pass Tallington after the first slowing outside Peterborough—a loss of more than 5 min.—and had to start the long climb of 15 miles dead slow. Nevertheless, Watson got such good work out of No. 774 that we were going 53 miles an hour when we passed Corby, and should not have fallen lower up the next three miles of 1 in 178 but for the furious side wind which swept across us at that high and exposed part, for our speed was steadily rising when we entered upon the length mentioned. The side wind, however, brought us down to 50.2 miles an hour, but this was excellent going up a grade of 1 in 178.

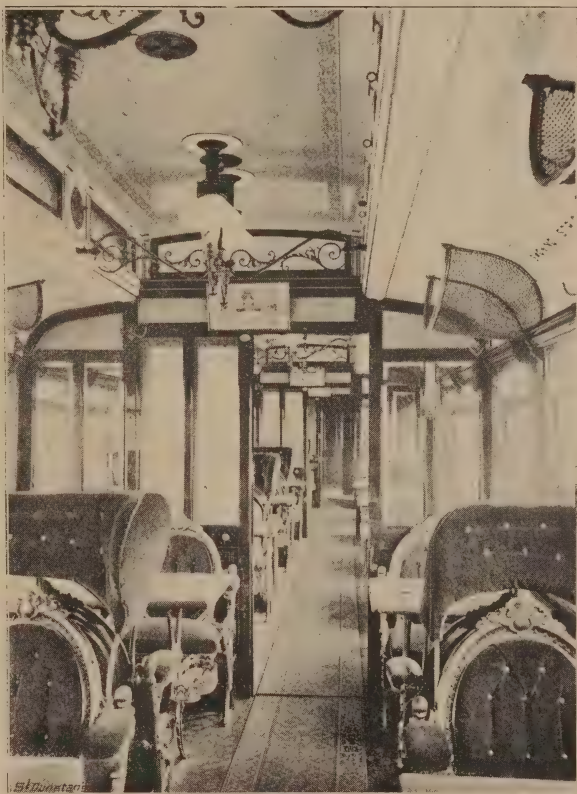
Stoke Summit, 100 miles, was passed in $113\frac{1}{2}$ min. from London, notwithstanding the loss of 8 min. by five slacks for signals and relaying. At Saltersford we experienced another signal check, and yet one more at Grantham Station; nevertheless, we passed through Grantham dead slow in 10 sec. under booked time from London, notwithstanding a loss of 9 min. by checks. The rest of the journey to the first stop, Nottingham, was easy work, and we stopped at New London Road Station 2 hr. 24 min. 34 sec. from King's Cross, in spite of 9 min. being lost by delays *en route*. This was unquestionably an admirable performance, being

equal to 2 hr. 15½ min. net for the 127¾ miles.

At Nottingham a change of engines was made, the fresh one being No. 1305, one of Mr. H. A. Ivatts's, "400" class of 6 ft. 6 in. coupled bogie-engines, with cylinders 17½ × 26. The driver did remarkably well under severe difficulties. We made a good beginning, covering the 39¼ miles of Great Central road to a signal stop just outside Sheffield platform in 49 min. 51 sec. But then came delays innumerable and exasperating. We got away from Sheffield in 2¾ min., but only to be stopped for 3 min. at Neepsend by signal. We escaped from Neepsend but to meet a like fate at Wadsley Bridge. And so on and so on, until our hearts sunk into our boots—where we left them! For the performance of Mr. Ivatts's engine and her driver I have nothing but commendation; No. 1305 steadily maintained 34.6 miles an hour up the long and steep and curved ascent to Dunford Bridge. But we were repeatedly and persistently blocked by Great Central slow trains in front; and to cut a long story short, we did not come to an anchor in the Manchester Central Station until 2.23 p.m., 23 min. late, all lost after the signal stop outside Sheffield. This points strongly to the need of some re-arrangement of time tables and instructions.

Returning by the 5 p.m. "diner" we had the same engine (1305) and train. It would be tedious were I to dwell on our experiences to Sheffield. Suffice it to say that, in spite of some very smart driving, we lost 12 min. through repeated blockings. Between Sheffield and Nottingham we picked up a couple of minutes, in spite of a bad cross wind. No. 1305 continued to Grantham, and ran the 22¼ miles to a signal stop just outside the station in 26½ min. We were delayed 2 min. by this signal

stop and 8 min. instead of the booked 4 min. at Grantham Station, and we left the latter 19 min. late. No. 664, 8 ft. single, had come on and four vehicles had been added to the load, bringing it up to nearly 230 tons. We made a smart run of 32 min. 2 sec. to the next stop, Peterborough (29¼ miles), and as we saved part of our booked 6 min. there, we started on our final run to London 17 min. late, instead of 19 min. as from Grantham. No. 98, another 8 ft. single, was our engine, and we got along well until near Hornsey, having covered the 72 miles in 85¾ min. But then came a series of checks, in fact, I believe we



INTERIOR OF NEW THIRD CLASS DINING CAR, GREAT NORTHERN RAILWAY MANCHESTER SERVICE

were slackened at every successive signal-post, so that we took *fourteen minutes* to run the last 4¼ miles, representing an average

speed of about 17 miles an hour, thus we finally stopped at King's Cross just 28 min. late, and this in spite of some capital locomotive work. It is a great pity that peremptory steps are not taken to keep the road clear for important competing trains.

As for the coaches, both first and third, nothing but the highest praise can be bestowed upon them by every impartial traveller. They are most comfortable and convenient in every respect. The *cuisine* is all that could be desired, and the attendance entirely efficient, courteous, and obliging. The "diners" each way and the up "luncher" seem to be well patronised, especially the third class; but the down "luncher" leaves London a full hour too early for general convenience; this will, doubtless, be altered later.

I append illustrations of the new and handsome dining-cars, first and third class, which have been newly built at Doncaster for the new Manchester service. It will be observed that in all essential features they resemble the other dining-cars used on the Great Northern Railway. They are very roomy and comfortable, while the employment of the six-wheeled bogies materially enhances the steadiness of the running. The upholstery, table fittings, lavatory conveniences, &c., are all that could be desired, and it is not surprising that these delightful cars, the acme of modern travelling comfort, are highly appreciated and have become very popular. The illustrations are reproductions of photographs courteously supplied by the Locomotive and Carriage Department at Doncaster.

THE WEDDING

Roll on, thou car, amalgamation's won,
The L.C.D. and S.E.R. are one.
The opposition growlingly resigns,
And clears obstructions from our "marriage lines."

They *railed* at us, and pressure tried to bring
To break monopoly, our wedding "ring."

Roll on, thou car, in fearless majesty,
Their idle taunts and jeers ignored by thee;

Though slanderous words assailed us in
the past,

They did not dare to say my bride was
fast.

And long-haired cranks suggested
seriously

We should be "*coupled*" automatically.

Roll on, thou car, and those who would
complain

May offer yet to hold the bridal *train*.

Roll on, roll on, and prove amalgamation
May raise us all unto a higher *station*.

And Kentish growers in the future may
Reap the good fruits of this our wedding
day.

G.

INVOICES AND OTHER DOCUMENTS

By A. C. CHAUNCY, *Great Eastern Railway*



It is said that "familiarity breeds contempt." It as often breeds indifference. The clerk in the Goods Office of a large Railway has, through long familiarity with his daily routine, come, in many cases, to regard himself as a mere machine. His daily lot is, like that of Mr. Gilbert's policeman, not a happy one. And talking of Mr. Gilbert's works reminds us that it was that writer who patented a process of extracting moonshine from cucumbers. It is perhaps almost as novel, not to say difficult, a thing to extract anything of interest from the daily task of a Goods Clerk.

The public does not concern itself much about the transit of its precious merchandize. The goods are sent off, and they are received; or if they are not received, or received in bad order, the public wants to know the reason why. But it may repay us to take a peep behind the scenes, and see some of the few things that really go on when goods are sent by rail. The sender generally condescends, either by himself or by his agents, to make out a consignment note. When

this note is made out in the sender's office by one of his clerks, well and good, it is generally legible. But the element of uncertainty comes in when the making out is left to a horny handed carman, or other son of toil, whose education did not include the cult of penmanship. The loss or damage to the eyesight of the



INTERIOR OF OFFICE, SILVERTOWN GOODS STATION, GREAT EASTERN RAILWAY

invoicing clerk is not an item that is charged on the invoice as a "paid on"; but when one considers this poor machine, working in a stuffy, gas-lit goods office, one wonders that some such charge is not made. This is the first step in the process of sending by rail. The consignment note is the evidence of the contract between the public and the carriers. It may be smart and regular, done in ink

GREAT EASTERN RAILWAY.

BEER.FROM ROWFORD TO BISHOPSGATE,
For IND, COOPE & Co
DELIVERY.Date _____ 187____
Truck No. _____

GREAT EASTERN RAILWAY.

GRAIN.Truck No. _____
From _____
To _____
Quarters of _____
from Mr _____
to Mr _____
Shewn No _____ Date _____ 18____GREAT EASTERN RAILWAY
GOODS.Truck No. _____
From _____
To _____
Consignee _____
Date _____ 18____

GREAT EASTERN RAILWAY

GRAIN OR SEED**USE PREPARE**Truck No. _____
From _____ Station _____
To SPITALFIELDS Station _____
Quarters of _____ from _____
Mr _____ to Mr _____
Date _____ 18____

GREAT EASTERN RAILWAY

GOODS.Truck No. _____
From _____
To BISHOPSGATE _____
Consignee _____
Date _____ 18____

GREAT EASTERN RAILWAY

MEAT.Truck No. _____
From _____
To BISHOPSGATE _____
Consignee _____
Charges to Pay £ _____
Date _____ 18____

GREAT EASTERN RAILWAY

CATTLE.Truck No. _____
From _____
To _____
Consignee _____
No of Head of Cattle _____
Charges to Pay £ _____
Date _____ 18____

GREAT EASTERN RAILWAY.

Truck No. _____
From _____
To _____
Date _____ 189____**DANGEROUS.**Label to be used for all Trucks containing
Matches, Gasoline, Benzoline, Petroleum,
and other Dangerous Oils.

GREAT EASTERN RAILWAY

HOME**EMPTY**

VIA _____ AND _____

A FEW OF THE DIFFERENT WAGON LABELS IN USE ON THE GREAT EASTERN RAILWAY

and a big round hand, or it may be scrawled in pencil on greasy paper. In either form it is legal evidence of the contract.

As money is the root of all evils, so the Invoice may be styled the root (we had almost written "route") of all Railway work in the Goods department. The Invoice is started on the journey through life by the Invoice Clerk, seated on a high stool and working under a flaring globe-less gas jet. In most cases the goods are brought in at the last moment, all together, and he has any time, from an hour to ten minutes, in which to make out his daily quota of invoices. An experienced man will rarely refer to his classification. His ready reckoner is ever his guide, philosopher, and friend. He has quite enough work for his jaded brain without arriving by practice at the cost of, say, 13 cwt. 2 qrs. 25 lbs. at

13s. 4d. per ton; and besides (though tell it not in Gath) the ready reckoner is often more correct. These invoices, when made out, are passed through the tissue copying book, where the copies, which when dry are fairly distinct, are left until they are abstracted. But of this process more anon.

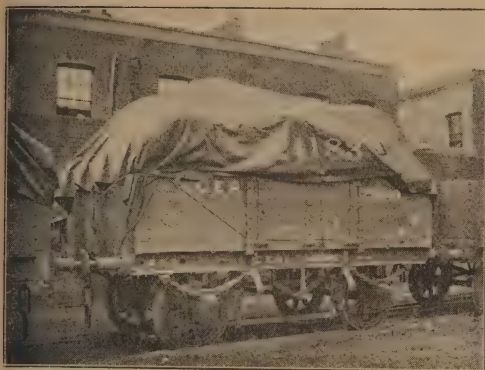
The invoices, as a general rule, travel with the traffic. They are still in many cases nailed to the side of the wagon by the office youth with hammer and tin-tacks, though most self-respecting, up-to-date wagons are fitted with invoice-clips. The latter process is much more

satisfactory to those who remember the days when the tack method was the general one, and the joys of abstracting an invoice when the rate, or possibly a figure in the "weight" column, had adhered to the tin-tack on the truck. If the charges only had so suffered it did not so much matter, as, of course, given the weight and rate, the ready reckoner did the rest. Sometimes, when the traffic has a very long rail journey before it across country, the invoices are intrusted



EXTERIOR OF SILVERTOWN GOODS STATION, GREAT EASTERN RAILWAY

to the care of Her Majesty's Postmaster-General. When the documents that are nailed to the wagon (we spell "wagon" with only one "g" in the Railway world) arrive at their destination, they are taken, more or less carefully, from the wagon-side, as are also their more fortunate brethren in the clips, and conveyed to the goods office of the receiving station, and checked, all the undercharges, and such of the overcharges as may be "spotted" (though there is not so urgent necessity for these latter to be noticed, as the public notice them quickly enough) advised to sending station. The invoices are entered



A TRUCK LOAD OF GOODS READY FOR
TRANSIT

Clerks who have toiled for years at this work, even now say that the feeling of satisfaction which comes to them when they successfully scrawl the red chalk "A" on the tissue copy to signify the completion of the job without tearing the tissue, is a joy to be experienced. The "inwards" invoices are much more simple to deal with. Here one has the satisfaction of dealing with figures that are more or less confined to columns. And within a given period from the end of the month all these invoices have to be abstracted and the abstracts sent away to the Audit Office. What becomes of them after that, few would care to say, but it is believed that after undergoing many and various other little processes, they eventually find their way to the Railway Clearing House, a place which to many exists as a shadow only, though people who have been there say it is a place of considerably more substance than shadow.

After having been abstracted, the invoice, one would think, would be let alone, would be superannuated, or otherwise put upon the shelf. It is in theory, but in practice a good many things may happen to it. After all the worry, anxiety and stationery that has been spent upon a consignment of traffic, a grateful public, one would think, will pay the charges cheerfully and with a good grace. But, alas! it is not so. Anyone interested in the subject

has only to look at some of the "Ledger deductions" to see this. This calls up another document, namely, the overcharge sheet. Overcharge may arise from many causes, and it is evidence of the zeal of the average forwarding clerk that overcharges are far more numerous than undercharges. We do not impute wilfulness to the invoicing clerk, but his long experience tends to make him err, when err he does, on the right side. Besides, it is so much easier to refund an overcharge than to collect an undercharge. The public may not agree with this, but it is the sad experience of one who has tried.

Overcharge sheets are of two kinds, local and foreign. The former are soon dealt with. The agents or stationmasters at both ends sign them, and the cash is refunded. The foreign overcharge sheets, however, have a longer and more varied existence. They have to go through the Goods Managers' offices of the various companies interested, and when at length they do return to the station whence they started, they are quite interesting documents as specimens of the autographs of these officials. Sometimes they do not return until the overcharge is forgiven and forgotten. In such a case the overcharge may be given to the canvasser to refund to the firm in his sphere of influence. The firm are so overjoyed at receiving an unexpected addition to their earnings, that



DELIVERING THE GOODS

after than does a passenger. The latter takes his ticket and jumps in. Thus he consigns and invoices himself. As a rule, too, he knows where he wants to go to, "tranships" himself at the proper junction, and is "not carted"—at any rate by the company—at his destination. It is a ready money transaction too, which is not always the case with goods traffic. There is no necessity to label a good, steady, sober passenger, and if the carriage wherein he travels is labelled the name of the destination is shown on a neatly painted board. But a choice collection of labels are kept for decorating goods wagons. We reproduce, on page 522, a few only of the labels kept in stock by one company. The nature of the traffic is proclaimed to all, also the number of the truck, its destination and the route by which it is to travel. If you want a hobby,

try collecting wagon labels. The writer tried it once, but after collecting some three hundred and sixty different specimens, still felt that his collection was very far from complete, and to make matters worse, the goods clerks whom he was continually worrying for specimens began at length to regard him as a species of harmless lunatic.

We stand often on a platform and see the fast express, with a shriek and a whirl, dash through the station at lightning speed. Here is the showy side of railway work. To-day you have been with me for awhile in the prosy, grim and grubby goods yard. Here you have seen some of the dull matter of fact side of the work. The public does not often see it, this uninteresting side, but as the great sage of Chelsea put it, "all work, that thou workest faithfully, is eternal."

THE SONG OF THE LOCOMOTIVE

Away, away, from the rankling care
Of the cities' busy throng!
I forge my way through the gleam of day,
And this is my lasting song:
"Oh! oh! for the scene of the meadows green
And the scent from the hedgerows bright,
Where wild flowers grow in the changing glow
Of the sun's prismatic light."
Past lake and fell, and woodland dell
Where green leaf laden trees
Throw soothing shade o'er the moss-clad glade
And whisper to the breeze.
Away, away, from the world of care
In peace I speed along!
The woodlands ring and the wild birds sing
A pæan to my song.

E. R. GREGORY.

"THAT NEW INJUN!"

By "N. E. STILUS"



WILLORIDGE, on the N.S.E.W. Railway had a new sensation, and the Company's servants, from the agent, whose gold-laced cap and coat were the envy of the 20 members of the local volunteer corps, down to the youngest cleaner—it being more especially a "loco matter"—were visibly affected.

For the benefit of those benighted individuals who don't *know* Willoridge—of course everyone has *heard* of it—it may be explained that it is the terminus of the branch from the big manufacturing town of Cortham in Blankshire, 25 miles away, and a popular resort of summer tourists. At one period in its history it was of considerable importance locally with its fairs and markets; but times have changed, and the railway now transports its produce, chiefly agricultural, though mining is still carried on in the neighbourhood, to more bustling centres of commercial activity.

The town—for the natives dignify the place by that title, though it boasts only some 3,000 inhabitants—consists mainly of one street wandering irregularly up the side of a steep hill, with houses remarkable for the variety and extreme simplicity of their architecture, and their inaccessibility from the roadway except by climbing several awkward steps. Two excellent old-fashioned inns—"hotels" are far too modern for Willoridge—are noteworthy.

At the foot of the street is the station, *the* feature of life and interest in the town, where the property of the N.S.E.W. Company comprises neat station premises, recently re-built, a too-small goods warehouse, coal drops, and an engine shed holding six engines.

It wasn't often that anything out of the common happened in this out-of-the-way corner of the line, but this was an event, unique and never to be forgotten. No less than the arrival of a brand new passenger engine for the Branch! Such a thing had never been heard of before; small wonder that the staff was "fair staggered," as the foreman porter put it.

It was the talk of the place! More so as the advent of "No. 674" was entirely unexpected, and took everyone by surprise. Even the locomotive foreman, "Owd Sam Hardie," who had been a driver for 20 years before he got his present job, as the reward of long and faithful service, "never 'ad no advice on 'er comin', or I'd a-gone down to Cortham to ride up wi' 'er!"

No, and it was dark when "she" arrived, running in front of the last train down, and there was no little speculation as to "what could be the meaning of it?" when the wire flashed the intelligence in advance that "a light engine" was coming.

"Nay, I knoas nowt o' no light injuns," said Owd Sam, when the signalman sang out from his box at the platform end, asking if he expected anything, and the agent, Mr. Wright, who joined him at the moment, opined that it was "very hodd."

"She's passed Belthrup, Sam," reported the signalman a few minutes later.

"Aye," replied Sam, "I hear 'er comin' up the bank, aye. She's a fine 'beat' wi' 'er wotiver she is."

By this time the three porters forming the platform staff, the booking clerk, a few station loungers seeing the last train in and out, with three or four platelayers hanging about for want of something

better to do, and as many enginemmen similarly employed or "booking off," with the night cleaners, were gathered together awaiting her arrival, for the signalman's "news" had quickly gone the round.

By and bye "she" could be seen, and at last with two sharp whistles for the through shunt she pulled up at the platform. Half-a-dozen lamps flashed in the faces of the enginemmen as the driver, looking out of the cab, called out, "Hullo, Sam, is this Willoridge?"

"Aye, it be; an' wot's tha doin' 'ere at this time o' neet?"

"Why, it's a new injun for tha. Where'll you 'ave 'er, for me an' my mate 'll have

tion, and resolved not to exhibit her to the public gaze "until she's been properly cleaned an' made fit to be seen." As has been observed it wasn't every day he got a *new* engine, and he meant to turn her out "reight."

So after a general inspection, and having satisfied himself she was "all cool," he cleared the shed of friendly but inquisitive interlopers, and, giving orders she was not to be moved, went home to supper.

The morning brought an official communication from the Locomotive Superintendent, advising him of the despatch of No. 674, and authorising the return of No. 261, one of the old class of Branch Passenger engines, which was required at headquarters. Sam was quite busy.

Meanwhile the new arrival was the subject of much comment in the little town, "where men most do congregate," and public curiosity was aroused.

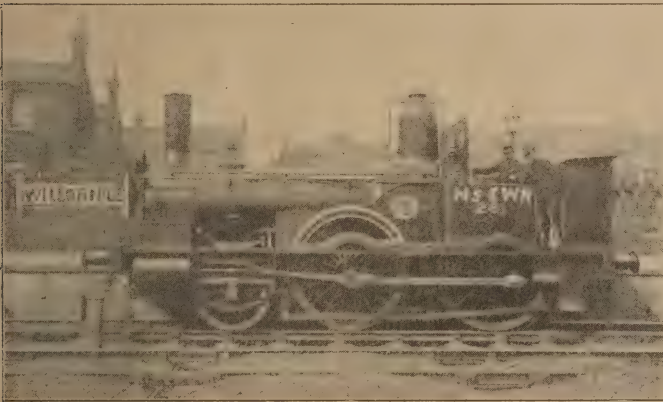
It was not surprising therefore that "Owd Sam," whom everybody knew, found himself a highly popular person-

age when he made his appearance on the platform, as was his wont, about ten o'clock, and he had to run the gauntlet of many questions, which occasionally somewhat tried his patience.

The Vicar, the Rev. Canon Surplus (a large shareholder in N.S.E.W. stock), who happened to be travelling, and "who always took a great interest in—er—locomotives, you know," hailed him pleasantly as he passed his carriage window, at which he was talking to Mr. Wright.

"Good morning, Mr. Hardie; I see we haven't got the new engine on this morning, eh? Mr. Wright here, tells me—"

"Wey, noa, Mr. Vicar, she wants a rub



"No. 261," ONE OF THE OLD CLASS OF BRANCH PASSENGER ENGINES

to look sharp and catch the 8.45 home again?"

"A *new injun*?" queried the astonished Sam, though he tried hard not to seem surprised. And a chorus echoed the words, "a *new injun*!"

"Aye, just out o' t' shops, lad," as Sam got aboard. "Right y' are mate." And with a pop of the whistle the driver gave her steam and backed away through the road to the shed, followed on foot by sundry interested persons. In due course "No. 674" was stabled, but being night it was not easy to get a good look at her by lamp-light. Sam, when he'd grasped the situation was quite set up with his acquisi-

down, an' besides she 'ardlins knoas her way aboot yit."

"No, I s'pose not. When may we have her running then?" The Vicar said "her" without knowing it.

"Oh, in a day or two, sir, mebbe."

"Ah! I should like to see her. May I call at your works" (the Vicar invariably referred to the shed as "the works") when I come in this afternoon?"

"Oh, aye, certainly, sir, if you'd like a look at 'er," inwardly assuring himself, "she'd be reight fettled afore *he* gets back fra Cortham."

"Thank you. Er—she's not been built specially for the Willoridge Branch, eh?"

"Noa, sir, she's one of a new lot, leastways a dozen of 'em or more, for this kind o' work. They've two like her at Cortham."

"Strong, eh?"

"Aye, she ought to du, sir." Sam began to feel hot.

"Umph! What number did you say it was?"

"674's 'er number."

"Oh! 674. Thank you, I shan't forget. Good morning."

Then Sam fell in with the P. W. Inspector. "Hullo, Sam, I wer just fer comin' across to see t' new injun!"

"Well, there ain't no 'arm i' that, Joe," replied Sam cheerily, "as soon as train's away."

And with that up comes "t' young Squire Lawson," whose father is on the board of the N.S.E.W. He is in riding togs, and taps Sam familiarly on the shoulders with his "crop."

"Mornin', Hardie, I heard at the "Lion" last night you'd got a new horse in your stables? Lucky man! Wish I'd a fresh mount to try to-day."

"Wey, sir, for the matter o' that you can have a turn on mine if ye be so inclined."

"Ha, ha!" laughed the young Squire, "thank you, but I'm more at home on one with four legs."

"As you like, sir," said Sam, "all a matter o' choice."

"Passenger engine isn't it? Good 'un to go?"

"I ain't tried 'er yet, sir, but I think she 'll force the pace a bit, mebbe."

"Good; but take my tip, Hardie, don't give her her head too much at the start, have a bit in hand for the run home, you know. Send you up a couple o' rabbits to-night, and a bottle of Scotch to christen her with." And he made for his compartment, as Mr. Sellwell, the local auctioneer and cattle salesman, pulled a big cigar out of his mouth and saluted Sam.

"Fine mornin', Sam."

"'Tis, sir."

"Anything in my way to-day? No old stock to enter for my weekly sale next Monday, eh?"

"Not as I know on, Mr. Sellwell, thank ye."

Sam was a bit nettled at this free and easy reference to his "pets."

"Oh! all right, you know best, I s'pose. But I heard you'd got some new blood at your place and likely would be weeding out some of the old crocks?"

"Aye, sir; folks 'ears a lot o' queer things hereabouts."

"So they do, Hardie." And Mr. Sellwell thought it wise to change the subject. "Have a cigar?" taking out his case.

"Thank ye, sir, doan't mind if I do; it'll pass a hour o' Sunday when I've nowt else on t' way." And Mr. Sellwell found a seat in the train.

This kind of thing went on, with variations, at intervals during the day, and indeed for the better part of a week, till "Owd Sam" began to wish he'd never seen "that new injun!"

Moreover, things were not exactly rosy among the staff at the shed. Sam had only three sets of passenger men and each had its own engine. The driver therefore who was losing No. 261 considered he had the prior claim to No. 674, and said so. But being the junior hand, the other two

drivers naturally objected. The senior, Bill Crofut, "as a matter o' princerpel, for I doan't want no fancy injuns an' mean to stick to my oan, owd 22, wot I've run for years"; whilst the second man, Peter Cotterell, "'ud be jiggered afore he'd see that furriner, Nick Bogie, have 'er!" This was an allusion to the fact that Nick was not a Willoridge man, but an importation from another station, which the natives regarded as little short of a crime, though the promotion had been quite in order.

Feeling ran high, and Sam was in a bit of a fix. In his opinion Bill Crofut was the proper man to take the new engine; but Bill and he had been mates for years,

alternative on Nick's part of "going to the Sassiety abaht it!"

That finally determined Sam, who told him he could go where he pleased; "an' if tha sets up any more ov tha lip to me, Nick, ma lad, I'll stop tha, an' thou'll get a month, no less!" But Sam, who was of a peaceable nature, felt that the lot of a locomotive foreman was not altogether a happy one.

Needless to say, this little "breeze" got about, provoking much outside comment among other grades of the service, and the railway interest was stirred to its very depths.

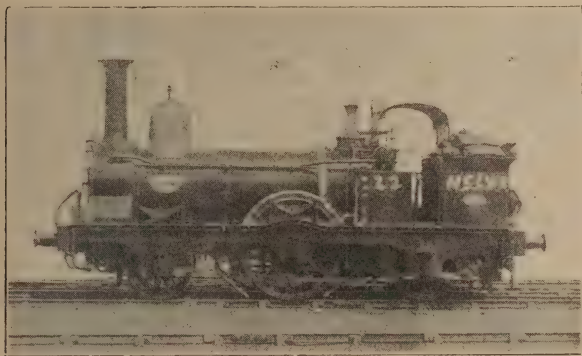
Nor were the townspeople less interested. As Ben Switchbar, the big ganger of the platelayers, said, "Quite a little swarm o' folk came to see 'er," meaning "674." "Wey, a remember nowt like it sin' that there ninety-three, owd Mat Kirby's injun, tha knows, gat off t' road at turntable an' bruk it. Tha minds o' that, Richud, doan't tha?"

"Aye, a du that!" replied Richard, who was in the squad; "didn't owd Mat sweer neither; 'e fair gasped, did t' owd man. It's two year cum t' feast; but this caps owt!"

"Aye!" from two or three others in chorus.

"But whoa'll be this cumin' fra t' Shade?" Richard continued, looking towards the engine shed. "Wey, blowed if it ain't that foxy little chap belongin' t' noosepaper. He'll a bin to see t' new injun."

And so it was. Mr. Setup, the local correspondent of the "Willoridge, Men-thorpe and Hawthorndale Chronicle, and North Moorland Weekly Advertiser," who, scenting a par. for his paper, had been down to interview Sam, much to the latter's disgust, which he took no pains to conceal, nor did he impart the slightest information of a practical nature to his



"I doan't want no ancy injuns, an' mean to stick to my oan, owd 22, wot I've run for years"

"an' if Bill didn't want 'er, why—" For, although Sam was nominally "gaffer," Bill had always taken good care not to let him come any of his "nonsense" over him; in fact, Sam's appointment, though he earned no more than Bill, had from the first been a sore point with the latter, for there was only the difference of a fortnight in the respective length of their services with the company.

So Peter Cotterell, or "Daddy," as his mates called him for some occult reason, got No. 674, and Nick Bogie had to take Peter's engine. This so incensed him that Sam and he came to high words, which ended in both threatening to take the matter to the "Boss," with a further awful

inquisitive visitor. But Mr. Setup had seen what he wanted—No. 674, just after she'd been well cleaned and washed out, ready for the road the next day.

And as for "information," a visit to the "Railway Arms" the same night supplied him with more than he needed for a "racy little par." For the bar parlour of that well-known inn is the local "board-room" of the N.S.E.W., and on its ample and beer-besprinkled table sundry "studies" in chalk, unintelligible to his uninitiated eye, save as rough outlines of engines, formed subjects of animated and noisy discussion among the locomotive men of Willoridge.

Thus he departed, well satisfied at his modest expenditure in drinks round, and in the next issue of the "W.M. and H.C., and N.M.W.A." appeared the following more or less true and particular notice, for which he was proudly responsible:—

"Railway enterprise at Willoridge. We are pleased to learn that owing to the representations of our energetic and much respected Locomotive Superintendent, Mr. S. Hardie, one of the latest type of passenger engines built at the factory of the N.S.E.W. Railway has this week been secured for Willoridge, where it arrived on Monday last.

"The new locomotive, No. 674, is an 8-wheel 'double-end' side-tank engine, of which 12 have now been turned out of the Company's shops, especially for branch

work where there are heavy gradients and quick runs.

"Painted, in the familiar style adopted by this enterprising Company, pea-green with black and white bands, and beautifully finished, "674" is an exceedingly handsome model, and has been much admired. She carries 1,400 gallons of water and 2 tons of coal, whilst the working pressure is 170 lbs. to the square inch. Adapted for working trains fitted with either Westinghouse or automatic vacuum brakes, and with all the latest improvements that skill and science can



"THE NEW LOCOMOTIVE, No. 674, IS AN 8-WHEEL 'DOUBLE-END' SIDE-TANK"

devise, the engine is thoroughly up to date, and a credit alike to designer and builder.

"We understand it has been entrusted to the care of Mr. Peter Cotterell, a Willoridge man, well-known in the district as a smart and clever driver, with, it may be confidently expected, the best possible results.

"The second day after its arrival here the engine was taken for a trial run, working two trips with the Branch goods to Cortham under the personal

supervision of Mr. Hardie. The test was thoroughly satisfactory, "674" proving herself strong and speedy, and she has since been engaged daily on the express and slow passenger-trains between Willoridge, Cortham, and Menthorpe.

"As will be seen from our advertising columns, our esteemed townsman, Mr. Turner Codak, photo-artist, always foremost where skill and enterprise are concerned, has already obtained an admirable picture of the new engine, which is on sale at the studio, and also at the office of this paper.

"We offer our congratulations to Mr. Hardie on the good fortune that has attended his efforts to render as perfect as possible the excellent service of trains

on the Willoridge Branch, and feel sure our readers, who are so much indebted to him, will join with us in recognising his good work and wishing him continued success."

When "Owd Sam" saw this he nearly had a fit. He was unaccustomed to such fulsome praise and half disposed to think the "W.M. and H.C. and N.M.W.A." was poking fun at him.

But he soon got over it; and as two other engines of the same class were sent to Willoridge shortly after, No. 674 had to give up her pride of place.

Still to this day in the local calendar of events a red letter marks the arrival of "that new injun."

N. E. STILUS.



FROM LONDON TO GLENGARRIFF

By Great Western Railway, City of Cork Steamship Company, and the
Cork, Bandon and South Coast Railway

By B. H. THOMAS, *Great Western Railway, Newport, Mon.*



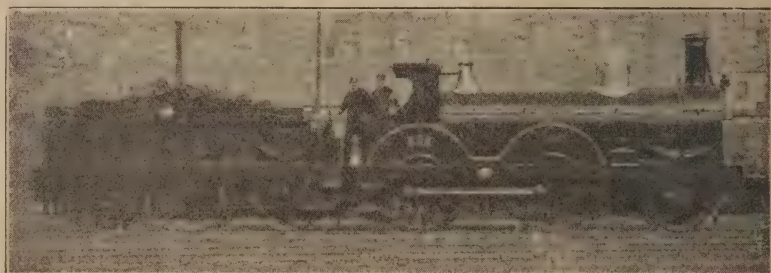
HE depopulation of "the distressful country" has, from time to time, and by various critics, been assigned to innumerable causes.

It has, however, been reserved for a writer in the "Nineteenth Century," who dared to reveal his identity by no more than can be gathered from a *nom de plume*, denoting the unknown quantity in an algebraic equation, to make the startling discovery that the Irish railways have been solely and entirely to blame for the backward condition of Ireland. The blight that had fallen upon all the old Irish industries was ruthlessly laid at the doors of the railway companies.

In contradistinction to the experience of every other country in the world, the writer proved, to his own satisfaction at least, that the introduction of railways into Ireland had caused widespread misery and destitution, dismantled nearly all the hitherto flourishing factories, destroyed the loveliest villages of the plain, converted the smiling homesteads of the labouring swain into shapeless ruin, and sent the fairest of Erin's daughters, and the finest of her sons, to distant lands to seek the means of livelihood that were denied to them in the land of their birth.

The refutation of so comprehensive an indictment as this can safely be left to the silent forces of public opinion, which wants for no better evidence than that afforded by the recent statistics of the gradual but

continuous growth of Irish traffic, and the well-known cheapness and rapidity of transit of passengers and merchandise from the remotest parts of Ireland to the great centres of population in Britain. The constant traveller to and from the Emerald Isle will tell you that never were there better facilities in the way of speed, luxurious accommodation, and reasonable fares, than exist at present. He can also



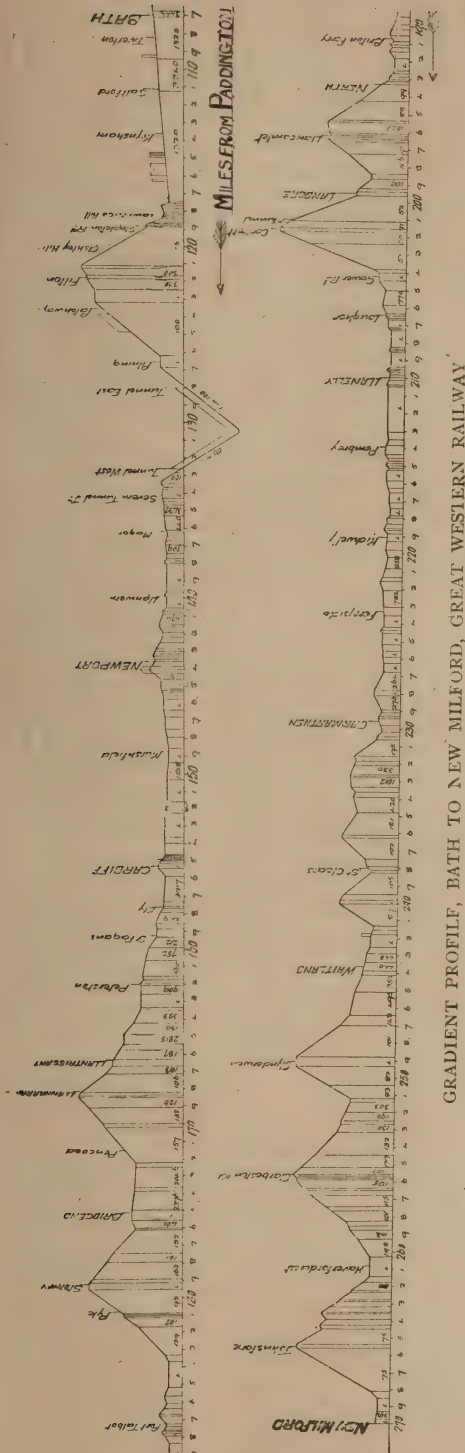
Photo, Busby]

[Newport

No. "808," ONE OF THE GREAT WESTERN RAILWAY 4-COUPLED ENGINES
THAT HAUL THE CORK EXPRESS BETWEEN CARDIFF
AND NEW MILFORD

vouch for the fact that not many years ago people of limited means looked upon a holiday tour in the "Green Isle" in much the same light as they now do a cruise in the Mediterranean, and a tour through the Holy Land. "Twenty shillings to London and back *via* Cork and New Milford"! This was the announcement that met the eye of the writer when cycling through the wildest parts of County Cork last summer, and the villagers were equally astounded as they realised how near London now seemed to them.

Whatever, therefore, may be the sins of omission or commission on the part of the Irish Railway Companies, there is no question that in so far as the English lines working in conjunction with the Companies that act the part of public ferrymen to and from Ireland, can stimu-



late travel by lowering fares and increasing facilities, there is absolutely nothing to complain of.

FROM PADDINGTON TO NEW MILFORD.

As already stated, the facilities now offered to intending travellers to Ireland were never better; but the coming season marks a gratifying advance upon all previous records.

It is not so very long ago that passengers to Cork by the southern route were compelled to leave Paddington at 10 a.m., and Cardiff at 3.15 p.m., in order to catch the boat at New Milford. Needless to mention, there was a complete absence of those much appreciated conveniences that are now furnished on the boat express, and the stoppages were too numerous to allow the possibility of styling the old service with the dignified title of "express." During July, August, and September of last year, the Great Western Company, for the first time, ran a special train from Paddington to New Milford every Tuesday, Thursday, and Saturday, leaving London at 4.30 p.m., and so fully did the results justify the expenditure, that the management decided to commence the same service this year two months earlier.

May the 2nd therefore witnessed the inauguration of this year's special service, the running of which is scheduled as follows:—

TRAIN AND BOAT SERVICE, LONDON AND CORK.

May, 1899.

Tuesdays, Thursdays, and Saturdays only.

Distance from Paddington, Passenger, Via Bristol Loop.			
	Paddington ...	...	dep. 4 30 p.m.
77½	Swindon ...	...	6.2 "
119	Stapleton Road ...	...	7.3 "
155	Cardiff ...	...	8.5 "
199½	Landore ...	...	arr. 9.8 "
	Swansea ...	...	9.20 "
	" ...	...	dep. 8.55 "
	Landore ...	...	9 12 "
261	Haverfordwest ...	...	10.40 "
270½	New Milford ...	...	arr. 11.0 "
Miles.			
430	Cork, per "Innisfallen" ...	...	9.0 a.m.

Distance from
New Milford.

	Cork (Penrose Quay) ...	... dep. 7.0 p.m.
	New Milford ...	... dep. 6.30 a.m.
70½	Landore ...	... arr. 8.10 "
	Swansea ...	... " 8.25 "
	" ...	... dep. 8.5 "
	Landore ...	... " 8.13 "
115	Cardiff ...	... arr. 9.12 "
151¼	Stapleton Road ...	... " 10.20 "
193	Swindon ...	... " 11.22 "
270¼	Paddington ...	... " 1.0 p.m.

When the number of inclines and the booked "slowings" are taken into consi-



Photo, Busby]

[Newport

THE GREAT WESTERN RAILWAY CORK EXPRESS IN NEWPORT STATION

deration, it must be conceded that, taken throughout, this is a very creditable run. That it can be improved upon there is no room to doubt.

For instance, when on December 7th of last year a special train was run from Paddington to Old Milford (269 miles 57 ch.) the distance was accomplished by the "Queen," a "single" engine, to Cardiff, and the four-coupled engine, No. 817, thence to Milford in the record time of 5 hours 34 minutes (8.51 a.m. to 2.25 p.m.), in spite of several checks through unforeseen causes; and the return journey in three minutes less

(6.4 p.m. to 11.35 p.m.).* For a material acceleration we have only to wait for the opening of the new direct line from Wotton Bassett to Patchway—which will probably mean a reduction of 40 minutes—and the inauguration of the long looked forward to daily (or rather nightly) service between New Milford and Cork. The past few seasons have witnessed a steady and regular increase of traffic, which augurs well for the six nights a week service being brought into operation at no distant date, but to what extent the hopes

for such a service will be interfered with by the opening of the Fishguard and Rosslare route, must remain for the present a moot point.

Last summer the Cork express train was worked between Paddington and Cardiff by one of Mr. Dean's well-known "single" driving wheels, bogie engines, the "Welling-

ton," with 7 ft. 8 in. driving wheels, cylinders 19 in. by 24 in., and between Cardiff and New Milford by a six wheeled engine having four-coupled wheels, 6 ft. 6 in. in diameter, cylinders 17½ in. by 24 in. So efficiently and punctually was

* On May 1st a special train, consisting of two eight-wheeled carriages, hauled by engine No. 159, was run from Paddington to Bristol (119 miles) in exactly two hours, viz., 4.3 p.m. to 6.3 p.m. The train stopped one minute at Swindon to take up a pilotman. This gives a running average of over a mile a minute. The engine referred to has single driving wheels 7 ft. diameter, and cylinders 18 in. diameter by 24 in. stroke.



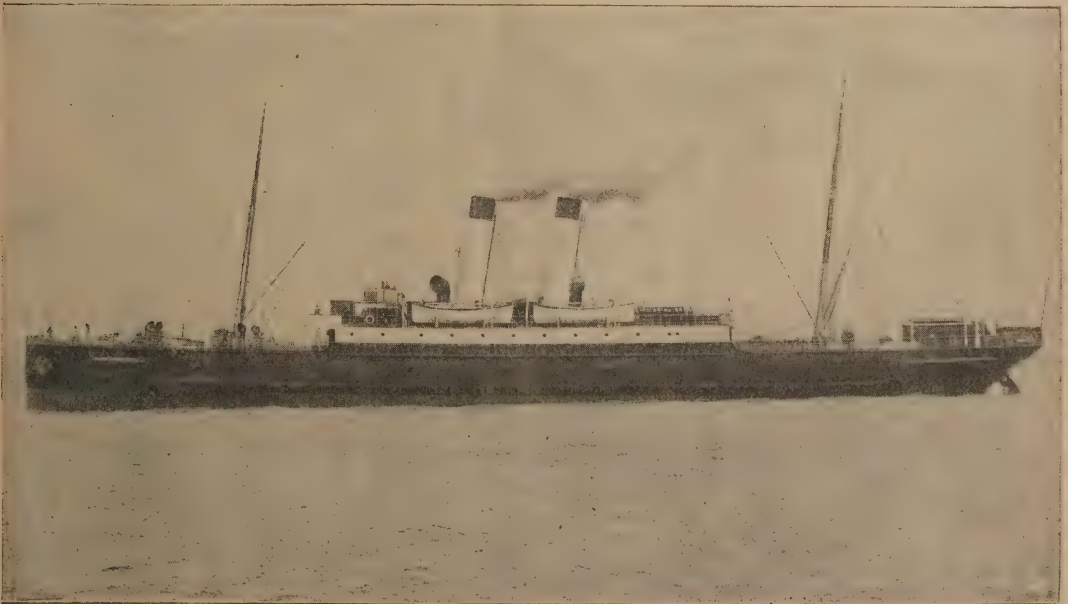
NEW MILFORD RAILWAY STATION AND LANDING STAGE, WITH THE GREAT WESTERN RAILWAY WATERFORD BOAT ON THE RIGHT, A GREAT WESTERN RAILWAY JERSEY STEAMER ON THE "GRIDIRON," AND THE CITY OF CORK S.S. CO.'S STEAMER "INNISFALLEN" ALONGSIDE THE PONTOON

the running performed that Mr. Dean proposes to continue the same arrangements this year.

NEW MILFORD TO CORK.

As compared with bygone years, the acme of expeditious travelling would ap-

pear to have been reached when the traveller finds it possible to leave London at tea time, breakfast in Cork, and lunch at Glengarriff, and most assuredly the very nadir of cheapness is within measurable distance when periodical third class *excursion* tickets by express service, available for a fortnight, can be obtained



THE CITY OF CORK S.S. CO.'S PASSENGER STEAMER "INNISFALLEN," 1405 TONS GROSS

throughout the season at week ends at the following prices—

From	To Cork and back.			To Killarney and back.	
	s.	d.		s.	d.
Paddington ...	25	0	...	33	6
Cirencester ...	19	6	...	28	0
Stroud ...	19	6	...	28	0
Cheltenham ...	18	6	...	27	0
Gloucester ...	18	6	...	27	0
Newport ...	16	0	...	24	6
Cardiff ...	16	0	...	24	6
Neath ...	14	0	...	22	6
Swansea...	14	0	...	22	6

history of the Cork S.S. Company is the fact that for some years after the business of their predecessors, the St. George Company, was taken over in 1844, they continued to run between England and Ireland the historic "Sirius," which bore the proud distinction of being the first steamer to cross the Atlantic to New York without the aid of sail. She left London March 28th, 1838, Queenstown April 4th, and reached New York on



THE GLENGARRIFF DAY MAIL TRAIN LEAVING CORK STATION, CORK, BANDON AND SOUTH COAST RAILWAY

The distance, be it noted, from New Milford to Cork is 160 miles, the return fare therefore from Paddington, for instance, works out to $1\frac{5}{8}$ d., or just a trifle over the farthing per mile, privilege enjoyed by all railway servants. The City of Cork Steam Packet Company, whose interests are most ably looked after by Mr. W. De Foubert, have all along cordially co-operated with the Great Western Railway in all that pertains to the convenience of passengers, and in the mutual desire to popularise the direct route to the South of Ireland. An interesting item in the

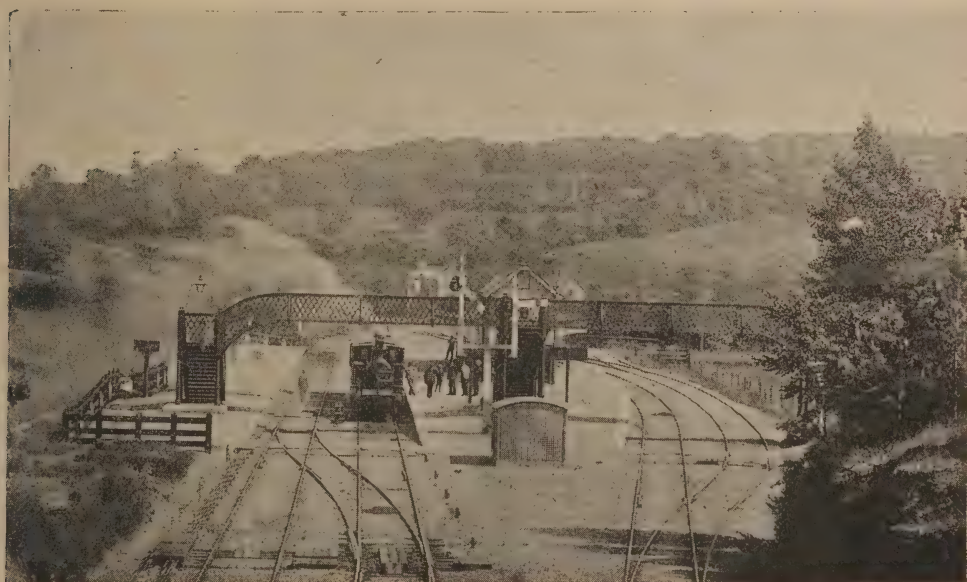
April 22nd, where a tremendous concourse of people awaited her arrival amid the greatest excitement.

The operations of the Company have met with considerable and well-deserved success, the original business having been extended to various continental lines. Mr. De Foubert has always held that nothing pays so well as public satisfaction, and it is gratifying to note that in spite of the drawback of serving a depopulating country, in the face of severe competition of Danish produce and American meat, he is able to prove that his passenger and

merchandise transit service can now challenge comparison with any in Europe.

Of late years attention has been given to improving the accommodation and increasing the speed of steamers running to and from Cork, and their latest fast boats the "Innisfallen," "Glengarriff," and "Kenmare" amply attest to the enterprise of the company. The first named is a handsome and commodious screwship of 3,000 h.p., elaborately furnished with the best and latest facilities devised by marine architects. Her dimensions are 283 ft. by

on pleasure bent, the few extra hours spent on the water on the southern route are fully compensated for by the glorious panorama that unfolds itself to the view of the tourist as he leaves the open sea and enters the magnificent harbour of Queenstown. Nowhere in the British Isles can be seen within close proximity to a large city, such a noble estuary, with water so pure and so rich in colour. The first glimpse of Queenstown on a sunny morning, with the beautiful and finely situated church standing out prominent, is



CLONKILTY JUNCTION, CORK, BANDON AND SOUTH COAST RAILWAY

36 ft. by 23 ft. to saloon deck, and she is certified to carry over 700 passengers.

The shortness of the sea journey will no doubt always be counted by a portion of the travelling community as a very important consideration in deciding upon a choice of routes to the "Green Isle," and until the shorter sea passage *via* Rosslare be an accomplished fact there is no doubt the present express service *via* Holyhead will bulk more largely in the public mind as the route *par excellence*. Still we feel constrained to assert, that if the passenger be

one that indelibly impresses itself on the memory of the stranger, and insensible he indeed must be to the innumerable beauties around, if he leave the deck for a single moment until the steamer reaches her destination. The harbour is studded with numerous islands, on two of which, Haulbowline and Spike, huge government buildings have been erected, the former containing a naval arsenal and the latter an imposing looking barracks and battery. The banks on both sides of the river are adorned by several fine residences, large

gardens, lawn-like fields, with a well wooded background. Here and there neat and prosperous looking white villages dot the landscape, all of which combine to effectually dispel, for the time at any rate, any preconceived notions the visitor may have formed respecting the obtrusive poverty and squalor of the "distressful isle." A fine promenade, double-lined and shaded with trees, extends along the south bank for a considerable distance—a very popular resort on Sundays and summer evenings.

The distance to the latter station from Cork is $11\frac{3}{4}$ miles, and the published fares furnish rather an interesting commentary on the arguments of those who desire State purchase of the Irish railways on account of the abnormally high fares existing throughout Ireland—First Class, 1s. 4d.; Second, 1s.; Third, 8d. The advertised rates for season and periodical tickets on the Great Southern and Western Railway line by no means suffer in comparison with those of our English lines.



BANTRY STATION, CORK, BANDON AND SOUTH COAST RAILWAY

Few if any cities can boast of such a good, cheap and frequent service of trains as that published by the Great Southern and Western between Cork and Queenstown, down the left bank of the Lee, and the Cork, Blackrock and Passage Railway which serves the villages, the boating and bathing stations on the opposite side. Quoting from "Bradshaw," we find that in the winter months so many as 29 trains are booked to run from Cork to Queenstown junction between 7 a.m. and 11.30 p.m., and 19 trains to Queenstown station.

During the summer 'afternoons express trains follow one another with bewildering rapidity, reminding the visitor of the London District or Metropolitan service; but the return fares, generally varying from 6d. to 1s. for $23\frac{1}{2}$ miles, compel our famous "underground" to a back seat. Happy indeed are the Corkonians in that they have almost at their doors the means of relaxation and recreation, and opportunities both by rail and boat of indulging in a wholesome and bracing breath of the briny at prices which in regard to distance, speed, and

comfort, are second to none in the United Kingdom. When it can be proved that State control will result in anything better than existing arrangements, we shall heartily join with Lowell in saying, "The time is ripe, and rotten ripe, for change; then let it come."

CORK TO GLENGARRIFF.

A large and increasing number of cyclists of both sexes favour the New Mil-

unhesitatingly declare in favour of the rail route from Cork to Bantry, and thence by coach along the coast of Bantry Bay to Glengarriff. There are two other routes, one by the Great Southern and Western to Mallow, the other by rail from Cork to Macroom, and coach to Killarney along the North Road—a splendid drive, affording some of the finest views in the southwest. The favourite and most expeditious route, however, is the first-mentioned,



GLENGARRIFF BAY

ford and Cork route for the purpose of touring the South of Ireland, and during the summer season the "Innisfallen" seldom performs a trip either way without having aboard several votaries of the wheel.

Cork is undoubtedly a very convenient starting point for a tour through Glengarriff, Killarney, Mallow, Lismore, and down the Blackwater, popularly known as "The Irish Rhine"; but having personally tried both methods of travel—the pneumatic and the locomotive—we

better known as "The Prince of Wales' Route."

Mr. E. J. O'B. Croker, the General Manager of the Cork, Bandon, and South Coast Railway, recently put on an express passenger train from Cork at 11.20 a.m., connecting with the down mail from Dublin, and also allowing ample time for passengers by the "Innisfallen" to accustom themselves once more to *terra firma*. The following is the combined train and coach service:—

Four-horse Coach.	Cork (Steamer) ... arr.		9.0 a.m.				a.m.
	„ C. B. & S. C. (Albert Quay) ... dep.	a.m.	a.m.	p.m.			9.30
		8.50	11.20	4.0			p.m.
			p.m.				
	Bantry ... arr.	11.28	1.50	6.39			
	Bantry (Coach) dep.	noon		p.m.	a.m.		
		12.0	2.15	7.0	7.15		
			p.m.				
		Glengarriff ... arr.	1.45	3.45	8.45	9.0	
Four-horse Coach.			a.m.				
	„ (Eccles Htl.) dep.		9.0				
			p.m.				
	Kenmare ... {	arr.	12.15				
		dep.	1.0				
	Killarney ... arr.		4.45				
Four-horse Coach.	Killarney ... dep.						a.m.
							9.30
							p.m.
	Kenmare {	arr.	1.15				
		dep.	2.0				
			5.15				
	Glengarriff {						
		dep.	a.m.	a.m.	p.m.	p.m.	
			5.45	9.45	12.15	4.15	
	Bantry ... arr.	7.30	11.30	2.0	6.0		
Four-horse Coach.			noon				
	Bantry (Rail) ... dep.	7.55	12.0	3.8	7.0		
			p.m.				
	Cork (C. B. & S. C.) arr.	10.36	2.26	5.45	9.40		
		„ Steamer ... dep.		p.m.			
			7.0				

Return to Cork *via* Mallow, Great Southern and Western Railway, or by same route as forward journey.

Although last season's results were somewhat affected by the decreased number of American visitors owing to the Spanish War, the 11.20 express was well patronised, and it is confidently anticipated that larger numbers than ever will this summer avail themselves of the Glengarriff and Killarney circular tour. The Cork, Bandon, and South Coast Railway, as can be gathered from the "Railway Year Book" for 1899, is a smart, well-managed, go-ahead line, possessing a stock of loco-

motives of the best approved pattern, while its passenger equipment, consisting of conveniently arranged saloon, smoking, and lavatory carriages, would do credit to more than one railway running into London.

Mr. Croker's latest idea is one calculated to considerably enhance the convenience of the patrons of his line.

Hitherto tourists, on arrival at Bantry, the terminus of the line, have had to leave the station and run down to the local hotel



CROMWELL'S BRIDGE, GLENGARRIFF

for refreshments, but all they will need do in the coming season is to step from the saloon carriages into the handsome and spacious dining and refreshment rooms now erected on the station premises, and drive direct from there, after dining, to Glengarriff. We may here mention that the Cork and Bandon Railway Company distribute gratis one of the neatest and most tastefully designed little brochures for the guidance of tourists, issued by any railway company, and the photo-

another, concerning the extraordinary beauty of this romantic region. Poets and litterateurs from both hemispheres have exhausted their vocabulary of superlatives in singing the praises of the enchanting scenery in and around the "Rough Glen," and no word-picture, however eloquent, can convey even a fair idea of the grand original. The glorious green harbour of Bantry, "where Britain's fleet may safely ride," the purple hills decked with luxurious foliage, the cloud-



INNISFALLEN, GLENGARRIFF

graphs of the "beauty spots" are excellent works of art, and reflect the highest credit on the artist, Mr. W. Lawrence, Dublin.

And now, having perforce to part company with the iron horse, we would fain accompany the reader in imagination still further to the paradise beyond, comfortably ensconced in one of those well-appointed four-horsed coaches that ply between Bantry and Glengarriff. Hard, however, would it be to find anything to say that has not already been said, in one place or

kissed summits of the mountains in the distance; the diversified colourings of sea, sky, heath, and rock, the rippling streams that run down the hillsides, these are only a tithe of the never-to-be-forgotten beauties of this the fairest spot in the United Kingdom. We may aptly conclude by quoting the words of the Poet Laureate: "Futile would it be to try and describe the drive along Glengarriff to Killarney by Kenmare Bay. I can only say to everybody, do not die without taking it"

THE CORRIS RAILWAY

By T. BOOTH



WHENEVER the history of "toy railways" comes to be written, the Corris Railway will take a fitting and honoured place amongst them. Its claims

to be included in a work of this description are that it serves faithfully and well one of the chief commercial industries of Wales, and at the same time combines in a marked degree the pleasure of affording communication to the most beautiful and varied scenery to be found in wild and rugged Cambria. It is not fitting however, to dwell at any length on the manifold charms the line possesses for the tourist. These are known and fully understood by

the increasing thousands who yearly visit the neighbourhood of the Corris Railway, and to those who are yet unacquainted with the picturesque treat which lies in store for them, our advice to such is not to neglect the opportunity of making one of the most delightful trips to be found in the kingdom.

The history of the line is not of mushroom growth. Its ripe years fit it for inclusion amongst the early railways of the country. More than forty years ago an Act was obtained entitling the Corris Railway to construct the Corris, Machynlleth and Dovey Tramroad. This was in

1858. At that time it was not considered advisable or practical to employ steam on a railway possessing a gauge of 2 ft. 3 in. When first opened, the line ran down to the river Dovey, to this day one of the finest fishing streams in Wales, and below what is now Glandovey Station. The Cambrian Railways had not yet found their way to the shores of Cardigan Bay; and the object of the Corris Tramroad



MR. J. R. DIX
General Manager, Corris Railway

Company was naturally to get within reach of water carriage. When in 1864 the new line was opened it was thought that the need for reaching the river had been removed, as the goods could be handed over to the Cambrian Railways at Machynlleth. When the Act of 1858 was granted it contained a clause restricting the use of

steam under a penalty of £100 per day; but in 1864, by a new Act of Parliament, power was granted for the use of locomotives. The Company then became the Corris Railway Company proper; and that portion of the line beyond Machynlleth was given up, but despite the fact that the necessary power to obtain steam had been conceded, the opportunity was not taken advantage of.

In 1878, however, the "dry bones" of the Company were shaken up, and the management determined to put into operation the powers which had been conceded. The line was reconstructed, laid with steel

Bill it was represented that "the railway was intended for the conveyance of goods and merchandise, and in reliance that it should be so used every facility was given for its construction. There was not then, neither is there now, any traffic in the district to justify the line being converted into a passenger line." A more crushing answer to such absurd opposition could not be well imagined than the number of passengers carried for the half year ending December 1898. We will show presently what need there was for such traffic, and how its numbers have been swelled year by year. How bitter was the opposition against the Company carrying passengers may be gathered from the fact that indignation meetings were held on the subject! Nothing daunted, however, the Company re-appeared in the Parliamentary arena the following year. After a hard struggle the Bill was passed, and those who had so loudly abused the measure were the first to avail themselves of the new powers conferred on the railway.

The getting of the Act of 1880 and the opening of the line, however, proved to be quite two different matters. The line



NEW COMPOSITE FIRST AND THIRD CLASS CARRIAGE,
CORRIS RAILWAY, BUILT AT THE COMPANY'S
WORKSHOPS

rails, and opened in the following year. Then followed one of the most absurd restrictions ever placed upon a railway company. No passengers must be carried! It was bad enough to be deprived of steam power when the line was first constructed, but to be possessed of a real working railway without the opportunity of conveying passengers was perhaps the most incongruous position any company could be placed in. However, a Bill was soon before the wiseacres of St. Stephen's asking for the removal of the ban; but so strong was the opposition by the owners of the slate quarries that the measure was thrown out. In the petition against the

would not pass muster. Some sharp curves had to be altered, and the Company had to go to Westminster two years later. In July 1883, the consummation of a long cherished scheme was accomplished, and Corris and Machynlleth were connected with a railway which has since been patronised by visitors from all parts of the world. The total length of the Corris line is 11 miles, including branches to quarries. It is difficult to work as will be readily understood when it is stated that there are gradients of 1 in 32, 1 in 34, 1 in 43, 1 in 46, 1 in 56, and 1 in 59. All these gradients are in the first 5 miles of railway from Machynlleth, and for the

same distance there are no less than 116 curves, of which 13 are under 3 chains radius, and 35 under 5 chains. The line

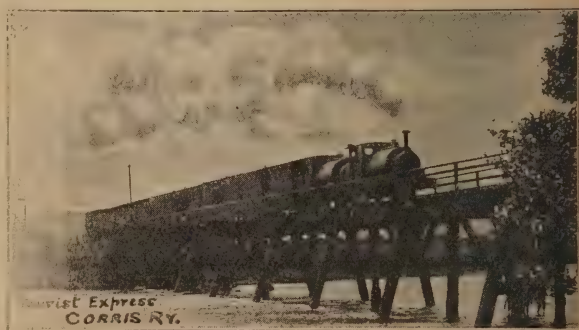
big number for goods traffic, but these are supplemented by another 150 belonging to the quarry companies. The largest number of passengers carried in any one day was 1,466, and the largest number in one week 3,293. Considering the carrying capacity at command these are very respectable numbers; in fact, the great growth which has taken place in passenger traffic is one of the most pleasing features in connection with the railway.

As far back as 1879, when they were unable to carry passengers

is worked by three tank engines, there are eight bogie carriages for passenger traffic, built on the plan of double coaches. They were designed by Mr. Dix specially to suit the requirements of the district, and to enable tourists to see the charming scenery through which the train passes. All the carriages and wagons are now remodelled on the premises. We reproduce a photo of the last carriage re-built. It is a composite first and third. The frame is of steel with top frame of oak. The outside panels consist of mahogany, and those inside of teak and mahogany. The wheels and axles for the carriages and wagons are supplied by Hadfield's Steel Rolling Company, Ltd., of Hecla Works, Sheffield.

Eighteen trucks do not suit the very

by rail, the Company carried by road during the months of August, September, and October no less than 4,632 people. The charge for the journey was 6d. How these figures have been swelled may be noted at a glance from recent returns. In



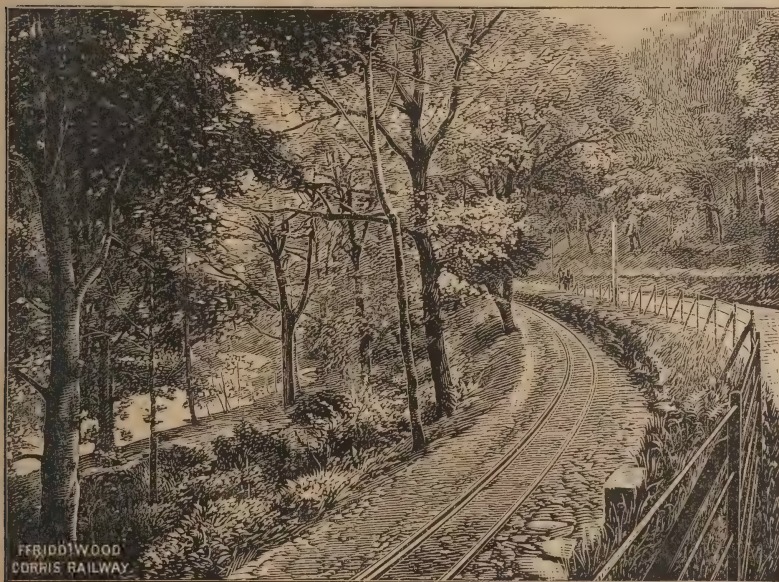
six months' time 82,000 passengers were conveyed, 55,801 being for the single journey, and 26,190 being the estimated

LOCOMOTIVE AND TRAIN—CORRIS NARROW GAUGE RAILWAY.

average journeys of those who have season or weekly tickets. Workmen engaged in the quarries are conveyed 30 miles for 1s., and school children are carried 50 miles for the same sum. These are the people referred to as season-ticket holders. That the quarries add much towards earning the dividend is an undisputed fact; but even allowing for the 26,190 carried by season tickets, which may be said to represent the quarry-workmen, there still remains 56,000 who use the line for pleasure only. The combined population of Machynlleth and Corris,

Tal-y-llyn Lake, Cader Idris, etc. Although not directly swelling the profits of the railway the coaching traffic is an important factor in increasing the number who use the line, and for this reason alone it is a sufficient inducement for the Company to combine rail and coach tours. The number of passengers carried in the last half-year was 81,991, the minerals amounted to 8,328 tons, and merchandise 1,446 tons. The gross receipts of the railway were £2,347 2s. 7d., passenger receipts were £833 15s. 2d., and parcels and mails £83 15s. 1d. The following

figures will do much to convince those who doubt the capacity of a light railway to cope with the traffic of any given district. Although not technically a light railway, the usefulness of the Corris Railway as a goods and passenger medium is worth citing as a recommendation for this class of locomotion. A glance at the



the terminus of the line, does not exceed 4,000. Omitting the tourist element altogether, the population of the district is carried at least twenty and a half times over during the course of six months. These are striking figures for the encouragement of more thickly populated districts who desire the benefits to be obtained from light railways.

Another interesting feature of the railway is the successful coaching tours organised by the manager, enabling the tourist visiting the Cardigan Bay health resorts to make day excursions to the Corris district,

the following table shows that this little line carries more passengers per train mile run than even the London and North-Western. The figures quoted refer to the half-year ended December 31st, 1898:—

	No. of Passengers.	Miles run by Passenger train.	Average No. of Passengers per train mile.
Cambrian ...	1,328,627	575,797	2'30
*L. & N.W.	42,132,677	13,015,870	3'23
Corris ...	55,801	10,407	5'36

For the benefit of those who are unacquainted with the Corris Railway and

* The 'Railway Year Book' gives 43,858,200, as the number of L. and N. W. Railway passengers, exclusive of season ticket holders.

the district it serves, it should be stated that the line is reached by train on the Cambrian at Machynlleth Station. The miniature line is immediately to the left of the up-departure platform, and the Lilliputian engine and carriages are easily discerned on alighting at the Cambrian Station. The journey from Machynlleth to Corris and Aberllefenny is through one of the most delightful valleys in Wales. After leaving the valley of the Dovey the line runs through Ffridd Wood and past the Llwyngwern Slate Quarry to Llwyngwern. A charming view of the river and the Esgairgeiliog Rapids and Salmon Leap are features of interest that command attention before the train reaches Evan's Bridge and the Horseshoe Falls prior to entering Corris. As regards fishing it should be mentioned that the river Dulas is free from Corris to its source. Tal-y-llyn Lake is free.

The takes are salmon, sewin, and trout. In the season it is possible to leave Aberystwyth and Barmouth in the morning, get to the foot of the mountain without exertion, have four or five hours on the summit, and return home in time for tea.

To close an article on this interesting little railway without some mention of its General Manager would be tantamount to the portrayal of "Hamlet" without the Ghost. It is entirely owing to the untiring efforts of Mr. J. R. Dix that the Corris Railway owes its envied reputation and assured prosperity—a prosperity which

shows itself in annual dividends ranging from 5 to 8 per cent. Mr. Dix may justly claim to have been born on the railway. He is the son of a railway man, and has seen 34 years of service. Nearly a third of this time was spent with the Cambrian, and for more than 20 years he has filled the post of General Manager for the railway now under notice. A recent departure introduced by him is that first-class passengers have the preference to the box seats on the Corris and Tal-y-llyn coaches. Mr. Dix is also a firm believer in giving the public proper inducements to travel,



and with this end in view cheap third-class return tickets are issued locally (and this, mind, where there is no competition) by every train, and all the year round. The wisdom of this policy has been proved by the number of passengers carried when compared with the population available—and by the dividends.

Through bookings are in operation from and to nearly all stations on the Cambrian Company's system, and the Corris Railway has excursion bookings to London, Birmingham, Liverpool, Manchester, Leeds, Sheffield, etc.

TIMBER FOR OUR RAILWAYS.

A Visit to the "Victoria Saw Mills," Bath.

By V. L. WHITECHURCH.

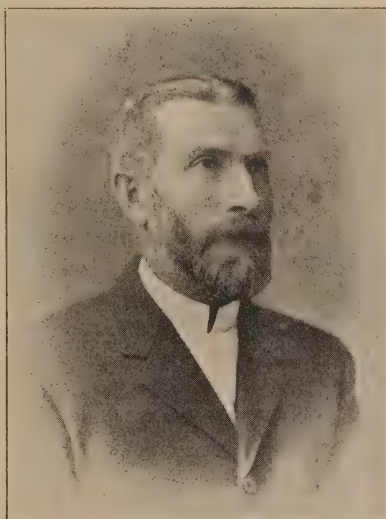
THE average railway passenger who lounges in his comfortable third or luxurious first-class carriage, although perhaps sometimes noticing the variety and "finish" of the fittings thereof, does not always realise the immense field of production out of which the modern railway coach emanates. Probably many of my readers when they enter a carriage stamped with the name of some well-known company's building works do not realise that although it was built in Old England the two vast continents of North and South America very probably played a great part in its production.

It was to see something of the manner in which some of our railway companies are supplied with certain important materials used in the construction of passenger coaches that I found myself, the other day, journeying to Bath in one of the smooth-running Great Western corridor trains. Bath, with its crowd of invalids and its records of fashion and frivolity, one would

have supposed would have been the last place to have gone to for the purpose of acquiring any details on the subject of railways. However, I duly found myself in the beautiful old city, and after a short walk entered the yard of another station, in which the brilliant colours of engines and coaches told me that I was treading

on ground which is the joint property of the Midland, and Somerset and Dorset Railways. By the way, I believe these are the only English companies who paint their engines the same colour as their coaches, and the red of the one and the showy blue of the other formed a very striking contrast.

Close by were the works of Messrs. Windebank & Son, timber merchants, whom I had come to see, and very soon I found Mr. Windebank himself waiting to



MR. OSCAR WINDEBANK,
Senior partner in the firm of Messrs. Windebank
& Son

show me round.

The first thing to notice was an immense pile of mahogany logs stacked close to a siding from which they had been unloaded from trucks by their own crane, which is fixed alongside, and will lift the logs

from trucks direct to the mills. In former days Spain was the great mahogany producing country, but now it comes from further afield, the pile before me having been brought from Honduras. From thence it comes by ship to Liverpool, and from Liverpool to Bath—the Midland Railway had been responsible for its transit. Mr. Windebank informed me that all this mahogany had been purchased through brokers, there being no

gany was destined for railway coach panels. The firm supply several English Railways with timber for coach-building purposes, the Midland Company in particular, and the greater part of that which I saw before me would ultimately make its way to Derby. The Midland Railway Company are about to build nine new corridor trains, and an immense amount of mahogany panelling is required in their construction. The firm in question



EXTERIOR OF MESSRS. WINDEBANK AND SON'S RAILWAY TIMBER MILLS, BATH

timber merchants importing direct in this kind of wood. An experienced dealer like himself is able to tell at once from the outside of the log what is its condition throughout. These logs are hewn square before they are shipped; and to give some idea of their size I might mention that one of them was 50 feet long by 30 inches square, while several were 45 feet by 3 feet. The 50 feet log mentioned above had cost £184, and one of the piles of logs before me was worth upwards of £4,000.

The greater part of this stack of maho-

does not actually make the panels themselves, but saws the logs into boards for that purpose, and does an exceedingly large business in this department of railway work.

We next entered a shed where this sawing operation was taking place, and there I saw two horizontal saws at work, both of them being quite new. The one was built by the Bristol Wagon and Carriage Works, the other by Kershaw Brothers; the first was capable of sawing up a log 50 inches square, the latter 24 inches. The log is laid on a traveller,

sliding on rails, and the saw, as I have said, works horizontally, the traveller working automatically with it. The utmost uniformity of thickness and delicacy of work is claimed for this style of machine, and it is certainly a beautiful process to see the huge logs of mahogany slowly being transformed to thin boards. There are two of these horizontal saws in Messrs. Windebank & Son's works, besides other saws, and they are driven by an engine built by Robey & Co., of Lincoln, one of their new under type, of latest production, which is certainly a very fine engine, and can be driven up to 50-horse power.

Passing out of this sawing shed, we crossed a yard in which many planks of mahogany were laid out in the sun for "colouring" purposes. These planks average from 15 to 20 or more feet in length, and the longer they are the better the carriage builders are pleased with them.

We next came across a stack of another kind of wood that is extensively used in carriage building—walnut. This, too, comes from America, the greater portion of it being imported from Canada, and known as the Canadian Black Walnut. A log of this sawn into planks presents a very curious appearance, the interior only being black, and a strip on each side the plank, varying from one to three inches in width, being white sap. This strip is cut away by the builders, the black portion

only being used. Many of my readers will recognize the beautiful dark panels in some of our first-class carriages as being made of this Canadian walnut. Another kind, known as "Circassian Walnut Burrs," is used for veneering purposes; this is almost dead black.

We next entered a large shed where the panels were carefully stacked for drying, each plank being kept separate by means of small strips of wood between it and its neighbour. In a stack of panels built like this the air is able to penetrate



DRYING SHED, MESSRS. WINDEBANK AND SON'S RAILWAY TIMBER STORES, BATH

throughout the wood. The drying process lasts about twelve months and upwards.

Of course, the firm supply wood for many other purposes besides that of railway carriage building; but with this the present article is not concerned. Mr. Windebank has catered for Railway Companies for about 13 years past, though he has been established for over 30 years, and he tells me that on a rough average he supplies one million five hundred thousand (1,500,000) superficial feet of timber for

railway and other purposes annually, the majority being destined for carriage panels. To cut one large log into panels often requires 7,000 to 8,000 feet of sawing!

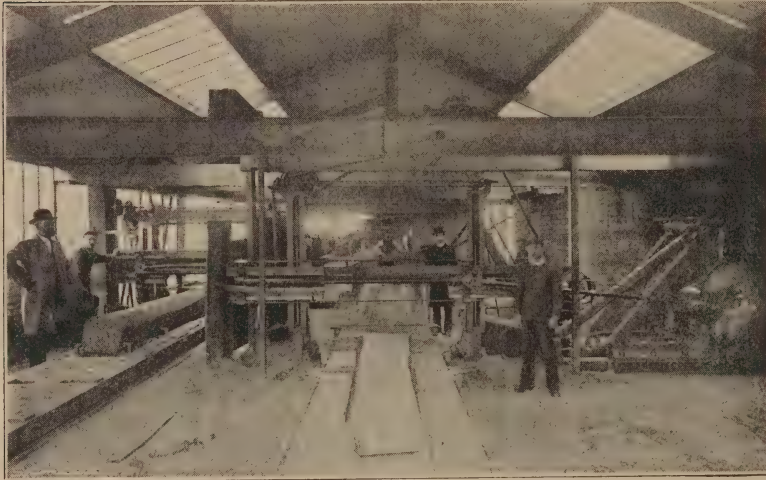
When the log of mahogany or walnut has been duly cut into planks, each plank is put back into its proper place, and the sawn log kept together by being banded with hoop-iron for sending away. The

skilful hands cut and polish and shape it to its own peculiar uses.

Mr. Windebank has supplied me with photographs specially taken to illustrate this short article. In one of them the horizontal sawing machine is very clearly portrayed.

The visit to the "Victoria Saw Mills" of O. Windebank & Son was certainly not without interest, as it gave one an insight into a branch of the detail work of our railways—an insight that the readers of *THE RAILWAY MAGAZINE*, I trust, may also care to possess.

I took train back to town in the afternoon Severn Tunnel corridor, running from Bath to Paddington without a stop. One



HORIZONTAL SAWING SHOP, MESSRS. WINDEBANK AND SON'S RAILWAY
TIMBER WORKS, BATH

iron is simply bent round the log and the ends nailed to a slab of wood inserted for the purpose. Then the log is lifted by a crane and comfortably dropped into a railway truck on the siding, which ultimately carries it to its destination at one of our great railway carriage building centres, where delicate machinery and

of Mr. Dean's powerful four-coupled engines, the "Barrington," drew us, and we arrived at Paddington four minutes under booked time, apparently much to the satisfaction of the driver, to whom I spoke. The run from Swindon Station to Paddington was accomplished in exactly one hour twenty-four minutes.

READING NEW STATION—GREAT WESTERN RAILWAY

By W. J. SCOTT, B.A.



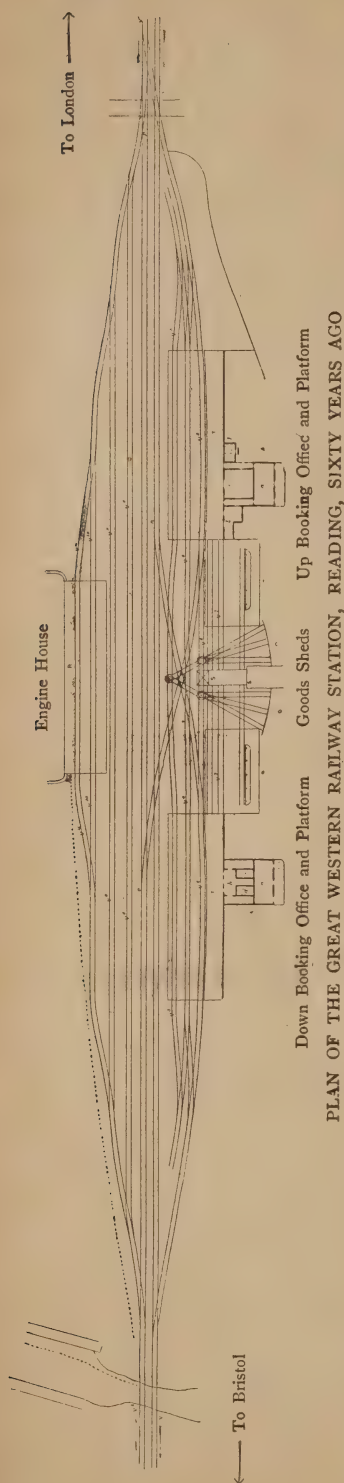
THE Great Western has never been a line of great stations—its beautiful and admirably worked London terminus always excepted; even now the only really striking one on its main line, viz., Temple Meads, Bristol, is “jointly” owned. It used, however, to hold a bad pre-eminence in stations which were at once hideous, inconvenient to the public, and awkward (not to say dangerous) to work; of that one-sided type, once common throughout England, of which Cambridge (Great Eastern) is now almost the only survivor. Cambridge station, however, is built of decent materials and is not dark, but Slough, Reading, Gloucester, Bristol (Bristol and Exeter Station), Taunton, etc., were all wooden structures, gloomy, grimy, and ramshackle. One by one they have all vanished, to be replaced by well-built and convenient, if not very striking stations, but Reading, the most “dowie den” of them all, has lingered on to the last years of the century. True, over 30 years ago improvements were made, and it began to be rebuilt a decade or more ago, but mostly in the Irish way of *pulling down*—the outcome being a “temporary” Down platform, with rough wooden posts and a roofing of tarred felt. Later on, however, some very satisfactory booking-offices and waiting-rooms in white brick, with a clock tower, were reared on the Down side, but in the section used as the “Up station” (for there were no platforms on the proper Up side); these buildings have been worked into the new structure, and form the chief booking-hall, opening on the No. 1 (or Down relief and branch-terminal) platform.

Although not one of the great “depots” of England, the Great Western Station at Reading is of interest for these reasons:—

1. As a most favourable specimen of a lesser-principal, or high-grade intermediate station and junction. 2. As being thoroughly good (of its own rank), and most well-planned for traffic working, set in the stead of one of the blots in our railway systems. 3. As a typical station of the latest type—typical in its good points and its limitations — which the Great Western officers now favour.

Before describing the station as a whole, it will be as well to see what is the traffic which it is meant to deal with. As the map on page 555 shows, Reading is for the Great Western a point where two considerable branches—one of which will itself be an important through line ere long—fork out from the actual main line; the said main line at this point having on it a threefold stream of West of England, of South Wales and Gloucestershire, and of “Northern,” i.e., Birmingham and Birkenhead traffic. A hundred yards or so away is the terminus of two other companies’ lines, but none of the South Western, and for most of the year none of the South Eastern passenger trains run into the Great Western Station.* (With the spirit of enterprise the South Eastern shows under its new general manager the opportunity of a good connection here, and a direct service between all the Great Western system and the Continent seems

* Last summer, one South Eastern fast to and from Tunbridge (for the Boulogne and Paris express) worked in and out of the Great Western Station with their coaches from and to Liverpool (Central), and will doubtless do so again from July 10th.



likely to be utilized ere long.) Of goods traffic, however, there is a fair amount of exchange by means of a rather awkward low-level spur line—owned by the London and South Western Company—between the two yards.

No one who has not made a reckoning, working-table in hand, would guess the number of trains, irrespective of branch "terminals," which stop at or run through "Reading—Great Western."

Speaking roughly, there are daily passenger trains about 40 (allowing for one or two "divided portions" and an excursion special), which call, terminate, start in the Down direction, besides, at least

16, or in summer 21 or more expresses which run past; of Up trains the number which pass without stopping is larger, but of those no less than 12 drop "slip coaches." Of goods and mineral trains, the number each way, if milk, fish, or horse-box express be added, will be not less than 50, giving a total in either direction of something between 110 and 120; in the excursion season, on Mondays and Saturdays, the total may be put as nearer 130.

To carry this traffic, there are the four roads—Main, Down and Up, and Relief ditto—which now stretch from Paddington for 53 miles to Didcot, except for a temporary break at Reading itself in the Down Relief line. Through the whole length of Reading yards, from the "East End" box to Scours Lane—a special junction box 2 miles 60 chains West—there is now an additional goods loop double line for the use of all goods, etc., trains dealing with traffic at Reading, whether for the fine new goods shed, the "Low Level" (Great Western) yard, or the sorting sidings at West Junction.

Of the passenger trains, besides those which pass through or simply call, a fair number terminate from Paddington, Windsor, or Slough, while others start for Didcot, Oxford, or Swindon. On the branch lines, trains for Basingstoke, and for Trowbridge, Southampton, or (locals to) Newbury have to be made up, while some work through to these points from London, or detach through coaches for them at Reading. Hence a station is needed with platform faces to at least four lines, having accommodation also for local trains starting in both directions, west as well as east; also with a terminal bay for branch trains at the west end and south of the main line; while it must also be easy for trains to pass from either of the through lines or to the branch ones. The length of Great Western trains, consisting as they often do of nine to eleven "bogie" coaches, with other vehicles such

and west of the station, lofty structures of red brick with yellow dressings, standing high up above any obstacle which might come across the signalman's line of sight. The larger of the two is the West Box (do not confound it with "West Junction Box," $\frac{3}{4}$ mile nearer Bristol); indeed this is the largest signal box on the Great Western Railway.

Its lower storey looks like the inside of a giant organ—an organ in which discords

levers; at present there are nine or ten blanks left; these make openings in the steel bridge through which the window front can be more easily reached, but it seems likely that most of these will ultimately be filled up. We wondered somewhat that there was no mid-station box, as at York or Perth, until we found that between the platforms the lines are clear of points, even of cross-over-roads; this has been done so as to keep clear of any



Sturges.

Photo, V. White & Co.]

[Reading

EXTERIOR OF READING NEW STATION, GREAT WESTERN RAILWAY

are made impossible by the "locking" arrangements; but (unlike some other modern cabins) with no "coupler-stops" in the shape of "selector-bars." The enormous weight of rods is carried on strong inverted arches of iron, which look solid enough for any load.

Above, the signalman and his telegraph boys dwell in a kind of glass palace, 100 ft. long, fitted with all that makes for the comfort of its occupants. The frame within it is arranged for no less than 185

fouling-points or safety bars, thus leaving trains free to draw up or stand at any part of the long platforms.

A shorter and much better placed junction line is now being made from the east end of the Great Western station, straight from that Company's main (fast) lines into the South Eastern Railway. It is on a rather steeply-falling grade going eastward, but otherwise is a convenient double-road connection between the two railways.

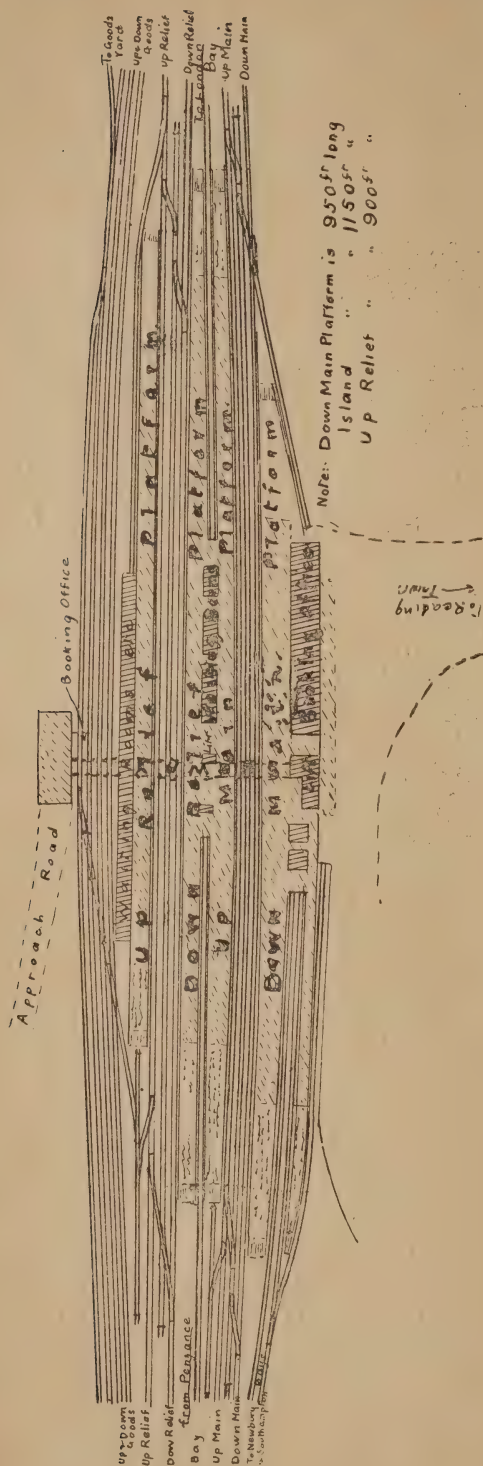
It is also intended to put some kind of covered gallery on the ground-level, for passengers who have to change from one station to the other, but thus far this work has not been begun.

The accompanying chart shows how Mr. Inglis, chief engineer, after consultation with the traffic officers, has dealt with the problem.

The general plan is that of all the Great Western suburban stations of today: three platforms, the middle one being an "island." The level of the line here is above that of the ground on either side, so that the whole station stands on a slight embankment, except where the approach road on the Down side rises up to its level, and a subway, airy and well lighted, runs under it about midway of its length. The main entrance is by the booking-office buildings already spoken of, adjoining "No. 1" (or the main line Down) platform. At its east end this platform has one siding (for horses, etc.) running at the back of it for a short distance; but at its western end it is pierced by a double bay 400 ft. long, practically making it into two platforms, of which the southern one has an additional line along its outside face for its whole length, about 430 ft. These three roads make a complete terminus for such branch trains as start from Reading for Basingstoke, the Berks and Hants line, or Southampton, and the trains using them do not foul the main lines at all. At its widest (in middle, near the subway lift) No. 1 platform is about 60 ft. wide, at other parts about 30 ft., while its length, end to end, is 950 ft.

Between this and the "island" platform come the Down Main Line, a "middle road" (which might be used either for trains which run through without stopping, or for engines running round their trains, or for standing carriages on, but as at present connected is not available as a through-road) and the Up Main Line. This last runs along the

south face of the middle or "No. 2" platform, which has the Down Relief Line on its other side. This splendid platform is fully 50 ft. across for a great part of its length, and is only a trifle less than 400 yards long—1,150 ft. to be exact. A single bay is let into it for 400 ft. at either end for "locals" starting to London, or in the Didcot direction respectively; in the middle, but rather towards the east, is a building divided into three waiting-rooms. Between the Down and Up "Relief" Lines is another "middle road"; then comes "No. 3" (or the Up Relief platform)—this has its western end about 180 ft. east of the like extremity of "No. 1," as it begins a good deal to the east of the latter, and also is shorter—900 ft. being its total length. Its width throughout is about 20 ft., but for nearly half its length there is a stretch of waiting-rooms and other offices running back for some distance. Though mostly a single platform, a siding runs behind it at the eastern end for about 180 ft., making it practically an "island" for that distance; behind the back of the waiting-rooms run the two lines of the goods loop before mentioned, with two additional goods roads for yard shunting, etc. The subway is carried on right under these to a second booking-office on the north or Caversham side of the station, of which it forms the outermost building. This makes the full width of the station not less than 100 yards—ten lines, three platforms, and two booking-office buildings. If each portion of platform having a face to a line of rail be given a separate number (as is done at York, for example), the result would be that one of the end "bays" would bear the number "13." As each of the dock lines in the middle "island" has a platform on both sides, this would slightly exaggerate the actual accommodation yielded; but it is absolutely true that the new station will give the same facilities for train-working as one of *eleven* single detached platforms.



Such a ground plan as this, designed with an eye to the special needs of the particular spot, could hardly be bettered—some companies (such as the North Eastern) might, perhaps, have made the platforms rather longer although the middle one is probably the longest, Taunton alone excepted, on the Great Western system. The materials, mostly brick and stone, are of the best; the various rooms (in all waiting-rooms, besides many other offices) are of good size and well furnished, and there is an ample length of roofing over each platform. Here, however, one comes to the “limitations” already hinted at. The roof is good, and even handsome enough of its kind, but it is all of the “verandah” type; not an inch of rail, even in the terminal docks, has any shelter over it. This has not happened by an oversight, nor from any “cheeseparer”; it is part of a policy to be followed, so it is said, in all future stations on the Great Western system. Mr. Inglis feels strongly, and he seems to have brought his colleagues and his Board to the same way of thinking, that “roofed-over” stations are a costly mistake; costly more especially in way of repairs, with little or no gain in comfort to the public in return for the outlay.

One fears to differ on such a point from so able and experienced an engineer; so far as English practice goes, “the flowing tide is with him,” ever since the Brighton Company took to spending much money in unroofing and otherwise worsening most of their principal stations. No doubt, in the early days, “all-over” roofs were put up with needless lavishness—e.g. Rillington Junction, Starcross, etc.; no doubt a walled-in and roofed-over station may be hideously dark and generally inconvenient, as at Carstairs. But surely, on wet and windy days—whereof so many befall in this happy island—when the rain is blown along in almost horizontal sheets, the gloomiest and grimmest over-roof, with its retaining walls, is better than the lightest

and brightest "verandah"-covered open platform, drenched with rain from side to side and end to end. Would anyone go so far as to say that York should lose its curved spans, and that the public would prefer the gigantic new Waverley station to be sheltered only by "tin umbrellas"? Will Mr. Inglis himself be "thorough" enough in his policy to strip the glass span off the main-line part of Temple Meads, Bristol, or even to unroof St. David's, Exeter?

Some day we may grow so familiar with great and important stations with only "shed" roofing, that there will be no suggestion of poverty or "roadside" in their appearance; but at this present—to the writer, at any rate—even so fine a station as the new Reading looks, for lack of an all-over roof, to be only a magnified and glorified "roadside intermediate."

In truth, despite the size of the town and the importance of the junction, Reading is not at this moment more than a lesser-principal station in time-tabular rank. For practical purposes, in all respects but one its Great Western train service is first-rate, as can be seen from the summary appended to this article. From London there are no less than ten direct trains without a stop, the first of which starts at 5.30 a.m., and the latest at 12.10 midnight; several of these run down in 44 or 45 minutes. To London the service is not quite so brilliant, as there are only seven direct trains (with several other fasts making one or two stops), and the quickest of these is allowed 47 minutes. The first (or last) ups leave at the curious hours of 2.41 and 3.14 [a.m. or "night"]. The first strictly "day" up started at 7.5, but since May 1st the earliest is 7.40 a.m. while the last before midnight is a fast at 10.40 p.m. In fact, being the western terminal point for the "suburban" service, Reading is supplied with London trains in a style which many an actual suburb might be very thankful to get.

In the way of communication from all parts of the Great Western system, its

accommodation is superb, since *sixteen* true expresses, besides a good many through fasts either stop or slip. True it is mostly a case of slipping; but "a slip is as good as a stop to an alighting passenger," especially when the carriage works through from the train's starting point. Unluckily, however, no *converse* to a "slip," no plan for picking up coaches at speed is now in use, or seems likely ever to be again adopted. And as the direct runs out of Paddington tend to grow longer and longer, the willingness to stop those expresses at a point only 36 miles out becomes less; hence in this respect, as to Down fast trains to West or North, Reading is none too well served. From Bath to Reading takes but 88 minutes (no stop), and from Birmingham 1 hr. 54 min. (Leamington only stop); *sed retrograre*—to Bath, the best time is 1 hr. 43 min., and to Birmingham—an unusually favourable instance by one evening train—2 hr. 12 min. In the number of trains the difference is much more glaring; from Birmingham to Reading there are nine trains (nearly all expresses); Down, there are seven, but only one of these is a true express. Plymouth to Reading can be done in 5 hr. 10 min. (by a train which could easily be 15 minutes or so quicker). Reading to Plymouth is over six hours by any train, even with a change of carriage; the best through one takes 6 hr. 16 min. In early days of railway history a fierce war raged between Reading and Didcot for local supremacy; when her rustic rival was worsted and sank into comparative unimportance, Reading's fighting spirit seemed to decline, and even the Tilehurst slip on the 6.10 p.m. Down—a slap in the face from one of her own subordinate hamlets—was accepted as England "pocketed" Majuba Hill.* For the present she

* The story goes that an exultant Tilehurstian said to a Reading friend whom he met on the platform at Paddington about six one evening: "So sorry we can't travel down together, but, you see, *our* express doesn't stop at any *intermediate* station; you'll get a train in about an hour, I think."

barely holds her own with Chippenham, but her citizens possess their souls in patience. When the Stert loop has diverted the Weymouth express on to the Berks and Hants line, and still more when that always-to-be-begun Castle Carey, Langport short cut is open, so that Newbury lies on the direct route to Plymouth, when, in fact, Reading becomes the forking point of the two halves of the West of England Main Line; *then*—well, then, it is hoped that “Taunton next stop,” or “next stop Yeovil” will be shouted on the Down platform at Reading; at any rate

since, and then—what will the Great Western tables be like in another ten years? is the thought which comes uppermost.

Reading “yard,” from East Box to Scour’s Lane, and from West Junction to Southcote junction, is so exceptionally long that it seems worth while to add a sketch-plan of it. The curve marked “6” is used by some express passenger trains between Basingstoke and Oxford, which leave Reading Station a mile to the eastward; one of these each way takes through Great Western coaches to or from Bourne-

mouth (London and South Western), transferring them at Basingstoke—they work through from and to Birkenhead. Some years ago South Western vehicles came in by Basingstoke to Reading (Great Western), the former Company running a special service—two or so trains each way—from Southampton and Winchester to Reading (of



Photo, V. White & Co.]

[Reading

INTERIOR VIEW, READING NEW STATION, GREAT WESTERN RAILWAY:
NOW IN COURSE OF CONSTRUCTION

that some Down express stops will balance those Up slips.

To-day, the percentage of trains which give Reading the “go-by” is certainly somewhat high; as we have said, 16 Down throughout the year—at least 20 in summer. But what a witness this is to the class of express service which the Great Western now supply, that nearly one train in three should spin past a county capital of 60,000 inhabitants, and an important junction to boot. Think of this, then read Foxwell’s just, though severe strictures on the Great Western only ten years

course with a Great Western engine on the latter’s line); but either they did not pay for “international” complications arose, as they were soon given up. One of the Oxford direct trains from Basingstoke also has a Reading portion, the split being made (*a la Strawfrank*) at Oxford Road Junction Box.

Should a new coat-of-arms be adopted by the ancient borough of Reading, we understand that a slip-coach “proper” (*i.e.* snuff-brown and cream-white) will form part of the blazon. Certainly no other place in Great Britain, and there-

fore, one may take it, in the world, receives "slips" from so many trains. Whence these vehicles come, and from what trains they are dropped, the appended "Schedule" will show.

SUMMARY OF TRAINS AT READING.

1. GREAT WESTERN RAILWAY STATION (Down).

(a) On Main Line—

1. Expresses	...	8*
2. Through Fasts	...	9
3. Suburban "	...	4
4. Stopping-trains	...	8
Total from or to London†	...	29
5. From Windsor, Slough, Maidenhead (Locals)	4	
To Didcot, Oxford, etc. (Locals)	...	4†
Total on Main Line	—	37

(b) Branch Lines—

1. Basingstoke Branch	...	9
2. Berks and Hants Line, and Southampton Trains	...	12
Total on Branches	—	21
Less through trains, Paddington, etc., to the Branch Lines	5	16
Total of Great Western Trains	...	53

* In the matter of Main Line Expresses, the Up table is widely different from the Down, owing to the great number of slip coaches, thus—

Express stops	...	5
Do slips (West of England, 5; Northern, 5; South Wales, etc., 2)	Total slips, 12.	

† Besides the above 8, 4 other Down fasts run at express speed from Paddington, and 2 from Ealing, for Reading, but fall below "40 miles an hour" beyond Reading.

‡ One is a local express.

2. SOUTH EASTERN RAILWAY TERMINUS (Up).

(a) South Eastern Trains—

1. Redhill, London (Charing Cross)	...	11
2. Guildford or Ash Locals	...	3
	—	14

(b) London and South Western Trains—

Staines & London (Waterloo)	...	13
Total of Trains at South Eastern Terminus	...	27

SUPPLEMENT—LIST OF READING SLIP COACHES.

Train due in Paddington at — (Starts from —)	Slip coach put on 12 train at —	Slip arrives at Reading.
10.25 a.m. (Wolverhampton)	Oxford	9.43 a.m.
10.32 a.m. { Hereford and Cheltenham }	Swindon	9.51 a.m.
12.15 p.m. (Birkenhead)	Oxford	11.33 a.m.
12.30 p.m. (Exeter)	Swindon	11.45 a.m.
2.7 p.m. (Liverpool Cent.)	Oxford	1.24 p.m.
3.30 p.m. (Birkenhead)	Oxford	2.45 p.m.
4.30 p.m. { Falmouth and Dartmouth }	Dartmouth (Kingswear)	3.50 p.m.
5.20 p.m. (Birkenhead)	Shrewsbury	4.40 p.m.
5.30 p.m. (New Milford)	Whitland Junc.	4.48 p.m.
6.30 p.m. (Penzance)	Swindon	5.45 p.m.
8.45 p.m. (Birkenhead)	Oxford	8.0 p.m.
10.0 p.m. (Penzance)	Swindon	9.19 p.m.

[Since May 1st the Birkenhead express, due in Paddington 10.50 p.m., stops at Reading to set down, instead of slipping a coach as formerly.]



Photo, V. White & Co.] [Reading
ANOTHER VIEW OF THE INTERIOR OF THE NEW GREAT WESTERN RAILWAY STATION
AT READING

CONTINENTAL TOURISTS FOR THE BRITISH ISLES

A New Departure of the London and North Western Railway

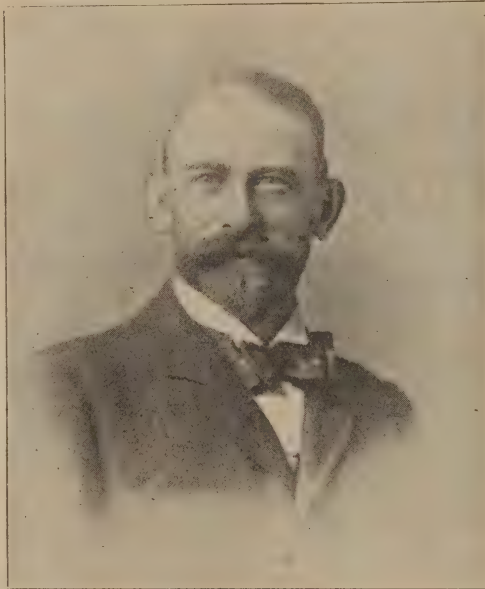
By A PARISIAN



ONE of the most interesting features in contemporary railway enterprise is the effort which the London and North Western Railway Company has decided on

now fly through the country as to the manner born; journeyings in foreign lands are organised for, and thoroughly appreciated by, young people, and even yachting has its attractions for many. The rising Frenchman, in short, is deve-

making to induce our Continental friends to visit Great Britain and Ireland. The average Gaul, as every body knows, has been rather a stay-at-home individual. A creature of habit, with a marked predilection for his native town or village, when he has not elected to exchange either of these for the fascinations of Paris, he has been averse to moving to fields remote and pastures new. But although this has been the decided characteristic of



MR. T. F. BURKE
Paris Representative of the London and North
Western Railway

the older generations, it is clear enough to the sharp-sighted observer that a change is coming o'er the national spirit. A taste for active exercise and for adventure is gradually asserting itself. Touring clubs have been formed by the votaries of the wheel, who

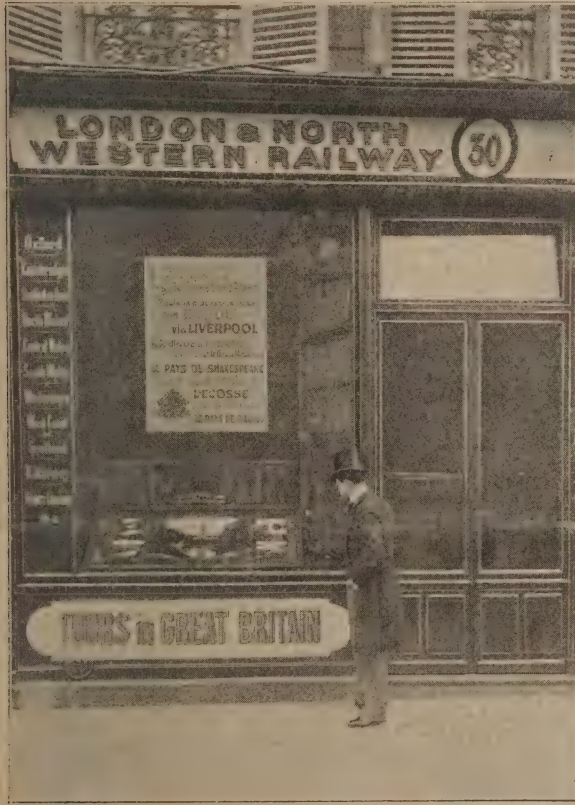
developing into a much more go-a-head specimen of humanity than were his fathers before him, and in this particular respect quite a new race is making its appearance on this portion of the globe. We have only to look to the international matches — rowing, football, and so on, which have taken place of recent years—to understand the significance of this new departure, and to perceive the vista of possibilities which it opens out.

Old prejudices, as a very natural result of this salutary movement, are fast dying out; indeed, we seem to be within measurable distance of their total extinction. The hosts of English people who annually find their way to the capital, to Normandy and Brittany, to the sunny Riviera, and to

other parts of France, act as connecting links between the two countries. How often have I heard the remark in times of crisis of late years, "Individually you British are simply charming, so how is it that we come to loggerheads with you as a nation?" Fifty years ago, and less even, an isolated observation of this kind would have been impossible. Now it is

Britishers who peaceably invade, "la belle France." It is a case of striking the iron while it is hot, and the enterprising directors and the able General Manager of the Company are most happy in their opportunity. Conversations which I have had with high authorities on these matters have fully confirmed me in this opinion, but, of course, we must look rather to the younger, than to the older generation of French people to do the pioneering business. Rome, as the saying has it, was not built in a day, and we cannot expect a general exodus of bold Gauls ere several touring seasons have rolled by.

What have been the obstacles hitherto to the determination to make a dash across the silver streak when the French pater-familias has been planning an excursion? Talks which I have had with experienced officials who have themselves done the deed have been edifying. In the first place, as they point out, hesitation has arisen as to the expense which the journey would entail. The average Gaul is a prudent person, and he likes to count the cost ere he commits himself. He might not find much difficulty in his estimate of the railway fares, but then has come the question of hotels, and of many minor details which he was practically unable to fathom. Then, too, there was the trouble of the language. It is very well



—EXTERIOR OF THE LONDON AND NORTH WESTERN RAILWAY OFFICE IN PARIS

the rule rather than the exception. Verily the times have changed, and we have changed with them!

Well, this is unquestionably the very best moment which the London and North Western Railway Company could have seized for its endeavour to win over Gallic recruits for visits to England's shores in exchange for the myriads of

to smile at such nervous conjectures, but, when all is said and done, such calculations impose themselves on every man who leaves the known for the unknown, and as the French are not given to solitary travelling, but prefer to do their little explorations in families or groups, the question as to whether the party might, so to speak, find itself

stranded ere it had got well under weigh, is by no means an unimportant one.

The London and North Western Company, fully comprehending the situation, has, as I understand, determined to make fully known to intending continental tourists the facilities which now exist for enjoyable trips in the United Kingdom.

The question of language, which assuredly is the first and foremost in every foreign mind when the would-be traveller has half determined "strange countries for to see," is practically settled already. Guides or interpreters are pressed into the service, and hotels are provided with a sufficient proportion of servants to whom "the French of Paris" is not altogether "unknown." Judging from what I have personally observed, this question of language is the one which overrides all others when our French friends plan a journey. They are quite ready to make tentative expeditions into Switzerland, and even to push so far afield as Cairo, where they are still, as it were, *en pays de connaissance*. It is not the detail of an hour or two more at sea which haunts them. I have crossed in a very good imitation of a gale from Granville to Jersey in company with a steamer-full of Gallic passengers, who crowded cabins and the deck over which the spray was pouring all the time, and who bore their punishment in the shape of ample doses of *mal-de-mer* quite

manfully. But they were aware that they were proceeding to an island where they would not be called upon to play the ungrateful rôle of fish out of water, where they would be understood, and where their wants as soon as expressed would be promptly satisfied; and so they were content to submit to the unpleasant ordeal. It had been an awful night, and a few timid spirits remained behind at the hotel, but the great majority confronted Neptune valiantly, and, if they paid their toll, they



BOULEVARD DES ITALIENS

(The thoroughfare in which the Paris Office of the London and North Western Railway is situate)

were rewarded at the finish. It is not the hour or the hour-and-a-half that must be devoted to the passages from Calais to Dover or from Boulogne to Folkestone which will scare them off. Give them a fair field when they have made the plunge, and they will respond with alacrity to the invitation.

For the Breton population particularly, a run through Wales has special attractions. The French, moreover, have always displayed more than a sneaking kindness for Scotland and Ireland. The Stuarts,

Queen Mary at their head, are still names to conjure with in their estimation. Walter Scott's works are, and have ever been, prime favourites with them. They take the lead with Byron's poems in French favour.

As regards Ireland, we all know what sympathy has always been extended by the average Frenchman to this romantic and somewhat distressful land. Descendants of the erewhile regal O'Neills, of MacMahons, and of many another ancient or prominent Hibernian house have long been settled here, and have held high posts in the service of the State in the

All credit to its active General Manager, Mr. Fred Harrison, for his bold initiative in this matter. He has seen what others had not yet perceived, that probably only a little encouragement is needed to set the stone rolling, and to do something to redress the balance between the English and French travellers. Why should one Gaul make his way to Albion for the hundred Britishers who cross the channel? Such statistics are out of all proportion to what they should be, and for every reason the programme which is being essayed is deserving of all support.

Wisely, therefore, is the leading railway company acting in its generation, and it is taking its preliminary measures on the opening of its campaign in praiseworthy style. It has started in that central and commanding position in Paris, 30, Boulevard des Italiens, with Mr. Thomas F. Burke, for many years attached to the General



THE PLACE DE LA CONCORDE, PARIS

Army and the Navy. The heart of France has gone out to Erin many a time, and Killarney's lakes and many another sweet and poetical spot have long possessed peculiar fascinations for her. Stratford-on-Avon again, the country of Shakespeare, Windermere, and old historical sites in fair England are no strangers, at least in story, to the French who will, almost assuredly, avail themselves of the opportunities furnished by the London and North Western Railway Company as soon as the more enterprising among them have realised the tempting nature of the facilities which it is placing at their disposal.

Manager's staff in London, as its Continental representative. Although Mr. Burke has been but a short time in the gay city, he has impressed those, like myself, who have come into contact with him, by his energy, his genial and tactful bearing, and his knowledge of the requirements necessary for the carrying out of the programme to which his administration has set its hand, and it is not too much to predict, that it will not be long before he makes many friends in his new surroundings. And what a bright and neat office it is, with its frames of coloured photo-

graphs of the prettiest and most romantic spots in the three kingdoms, its tasteful furniture and its sunny aspect. These quarters are shared with the South-Eastern and Chatham Companies, which, far from being rivals, will themselves benefit by all this enterprise. Almost coincident with the London and North Western Company's essay in the attempt to bring about, sooner or later, something in the nature of a flow of travel from the Continent to the United Kingdom, is the satisfactory arrangement that railway has recently come to with the South Eastern and Chatham and Dover Railways, under which the London and North Western Railway will have direct communication with both of those lines in future, instead of with only the London, Chatham and Dover Railway, as in the past. It is, indeed, a case of a long pull, a strong pull, and a pull all together. Crowds of boulevard *flâneurs* gather before the windows to gaze and reflect, and who knows how many excursions will be planned during these strolls. The London and North Western Company indeed can now count with confidence on the cordial and energetic co-operation of the French companies, which are on their side regarding its activity with marked sympathy and favour.

I have excellent reasons for saying that the French railway officials at large are fully alive to the importance of this new undertaking, and are determined to second it to the best of their ability and by every means in their power. Only make the position of affairs perfectly clear to the public, they say; only save it from anxious calculations as to cost and the rest; only guarantee that it shall be safely piloted about, and victory will be yours. The Great Exhibition will, as my readers are well aware, be held in Paris next year, and it might be imagined that such a stupendous attraction would prove something of an obstacle to a good start. The highest French authorities are, however,

unanimous in predicting that, so far at least as the inhabitants of lively Lutetia are concerned, the reverse will probably be the case. The reason is very simple. Our Parisians like to have their leading thoroughfares and favourite promenades as much to themselves as is compatible with the prosperity of their beloved city, and they are therefore disposed to view a tremendous influx of visitors from all quarters of the globe with a certain amount of misgiving. The wonted corner in the café or the restaurant, which has become, as it were, part and parcel of their lives, will perforce have to be sacrificed pretty frequently, and so it will be with other customary haunts as well. Thus when they have inspected the big World's Show to their heart's content, and when the date of the annual holiday approaches, our worthy citizens will be more eager than ever to shake off the dust of their town from their feet; and, moreover, by way of contrast shall we call it, also in a mild spirit of retaliation, to carry the war, figuratively speaking of course, into the enemy's camp, and to visit the lands of some of the foreigners by whom France's capital is being invaded. Paris and the northern departments are the wealthiest districts in this country, so that their neighbourhood to England is of particularly good augury to this enterprise, but as a matter of fact the hearty co-operation of the various French companies will render longer distances an affair of comparative insignificance. Hundreds of thousands of passengers found their way to Paris from every corner of France during the last Exhibition in well organised excursion trains, without betraying any symptom of fatigue, and, as I have remarked, the stone once set rolling, there is no limit to the pleasant possibilities of this new departure.

After all, what is a run over to England, an eight hours' journey to London, with easy and agreeable tours in different directions afterwards, when contrasted

with the protracted expeditions which the effort to obtain a fair idea of the continent of Europe entail? My first acquaintance with this same Continent was made at Antwerp, after a passage from London in the teeth of a terrific gale. Barely a week had rolled by when I was in the Eastern regions, after many adventures on rail and in boat, and that, too, among foreigners whose languages are still well

dozen or more diminutive steeds, which galloped along as if they were determined to upset the clumsy vehicle. How, too, have I sometimes wished, as I was being shaken to pieces in a clumsy railway carriage in this same clime, that I was in some good ship in the chops of the Channel, even in a moderate gale, that alternative being decidedly preferable even from the point of view of physical comfort.

And the robbers—I had almost forgotten the bandits! Yes, that particular form of excitement was not lacking, either. We travelled with patrols along the railway lines and with guards accompanying the *diligences*, and I still possess a belt expressly made for me of chamois leather, in the lining of which, specially adapted to that purpose, I deposited as much of my treasure as I deemed it expedient to take with me, fitting the *ceinture* round my waist under my lightest garments.

It is not under like auspices that our Gallic friends will make their acquaintance with Great Britain, with the London and North Western Company as conductor, guide, and cicerone; and they know it, too. None better understand the Englishman's appreciation of the word "comfort"; and although some things may prove a puzzle to them, they know beforehand that this comfort is guaranteed to them.

And how rapidly are they entering into our ways and fashions. Hosts of English words have crept into their language. What they are pleased to term a "five o'clock" has become a veritable institution. They will need no introduction to tea, for instance, any more than to stout, pale ale, and even to "*Scots'* whisky"; while, if they happen to be on your side of the water at Yuletide some may perchance call for "*Mice* pies," of



INTERIOR OF THE PARIS OFFICE OF THE LONDON AND NORTH WESTERN RAILWAY

nigh a sealed book to the inhabitants of other lands. What curious anomalies, too; I am speaking of over a couple of decades ago. An easy journey in a saloon carriage, fitted up with sofas, chairs, and tables, and with a lovely balcony as well, to be exchanged for a rough-and-tumble experience in a jolting *diligence*, totally innocent of springs and open to the four winds of heaven, drawn, moreover, by a

which I witnessed some rather odd specimens last Christmas. Well, when all is said and done, the outlook is most encouraging. It is nigh time that the French should be paying return visits; and once this sort of thing bids fair to appertain to the domain of that surviving and still robust tyrant in Republican France, "*la mode*," places will have to be booked months before they are required. I venture, as an old traveller who has surveyed mankind from one end of Europe to the

other, and who has had peculiar facilities for the study of French tastes, character, and feeling, to predict conspicuous success for the enterprise displayed by the London and North Western Company, which is making all its arrangements with the best judgment and method. It deserves well of both countries; and what higher praise could be accorded to its intelligent and interesting initiative which will be followed with sympathy by every lover of peace and goodwill among the nations?

FORSAKEN

The Wail of the British Locomotive

ONCE on the British railroad I
In solitary grandeur reigned,
Nordreamed my world-wide fame would die,
A fame by honest labour gained;
But now, alas! my reign is o'er,
My hard-earned name has passed away,
And I must yield my place before,
The engines from the U.S.A.

Forsaken by my native land,
And spurned by those who know me well,
In fear and trembling I stand,
And hearken to my funeral knell.
No more my brilliant copper dome,
Shall sparkle in the beam of day,
For I must yield my place at home,
To engines from the U.S.A.

From Stephenson's of "Rocket" fame,
To flyers of the present age,
The cry of nations is the same,
The British engine is the rage.
But now I view with great alarm,
The dawning of the final day,
When I must ever yield the palm,
To engines from the U.S.A.

Is this then Britain's gratitude?
To idly cast me thus aside?
My mind with jealousy imbued
And humbled to the dust my pride?
Or must I be the nation's toy?
To cheer them and be cast away?
The while they fondle in their joy
Those engines from the U.S.A.

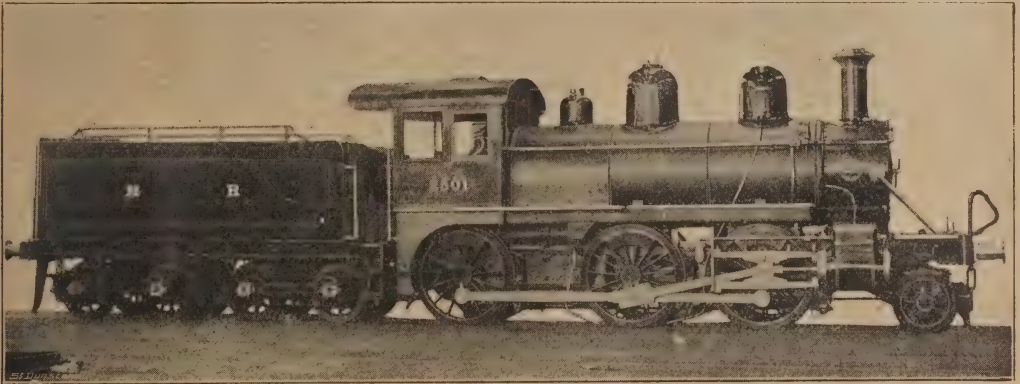
E. R. GREGORY.

“MADE IN AMERICA”



HEY have arrived at last, and below is an illustration of one of the ungainly assemblages of iron etc., that will do duty on the Midland Railway as a goods locomotive. Being an adaptation of American principles of construction to meet the exigencies of an English railway that awoke one day to

box, outside cylinders, valve-chests, etc., and “rockers” to take the motion from the eccentrics. An extended cab is provided, and the tender is supported on two 4-wheel bogies, which do not appear necessary for so short a tender. The proprietors of the Baldwin Locomotive Works, Philadelphia, have kindly supplied us with the photograph and the following dimensions:—



No. “2501,” ONE OF THE “MONGRELS” BUILT IN THE UNITED STATES FOR HAULING GOODS TRAINS ON THE MIDLAND RAILWAY

find it was urgently in need of additional locomotives, it is not surprising that in “No. 2501” and her sisters are reproduced the worst features of home and American design. So far as appearances go, these are evident in a sandbox placed on the boiler barrel (a position long abandoned by enlightened British locomotive designers). [It will be seen that a small sandbox, for use when running tender in front, is provided below the frames.] Then we have the pony-truck, and the staying of the buffer-plate to the sides of the smoke-

Class 8-30-D, 511-540. Gauge, 4 ft. 8½ in.

MOGUL LOCOMOTIVE FOR GOODS TRAFFIC,
MIDLAND RAILWAY, ENGLAND.

CYLINDERS.

Diameter	18 in.
Stroke	24 in.

Balanced with vacuum valves.

BOILER.

Diameter	4 ft. 8 in.
Thickness of sheets	⅝ in.
Working pressure	180 lbs.
Fuel	Bituminous coal.

FIREBOX.

Material	...	Copper.
Length	...	6 ft.
Width...	...	2 ft. 9½ in.
Depth...	...	6 ft. 4¾ in.
Thickness of sheets :		
Sides	...	½ in.
Back	...	½ in.
Crown	...	½ in.
Tube-plate	...	¾ in. and ½ in.

263 TUBES.

Diameter	...	1¼ in.
Length	...	10 ft. 5¾ in.

HEATING SURFACE.

Firebox	...	125·3 sq. ft.
Tubes	...	1247·1 sq. ft.
Total	...	1372·4 sq. ft.
Grate area	...	16·6 sq. ft.

WHEELS.

Diameter of driving	...	5 ft.
Diameter (without tyres)	...	4 ft. 6½ in.
Journals	...	7 in. by 8 in.
Diameter of pony-truck	...	2 ft. 2 in.
Journals	...	5 in. by 8 in.

WHEEL BASE.

Driving	...	14 ft. 9 in.
Total engine	...	22 ft. 9 in.
Total engine and tender	...	43 ft. 0 in.

WEIGHT.

On the 6 coupled wheels,	37 tons 1 cwt. 3 qrs. 24 lb.
On truck	7 tons 13 cwt. 14 lb.
Total of engine	44 tons 15 cwt. 10 lb.
Tender	35 tons 8 cwt. 4 lb.
Total engine & tender	80 tons 3 cwt. 14 lb.

TENDER.

Diameter of wheels	...	3 ft.
Journals	...	4½ in. by 8 in.
Water capacity	...	3900 gallons.

It is claimed that with the American type of locomotive both larger cylinders and increased heating surfaces can be obtained, but neither of these essentials has been taken advantage of in designing these engines.

The works number of "2501" is 16,622, and the circular maker's plate is affixed to the side of the smoke-box. The English buffers and other fittings were sent from Derby to Philadelphia, and there fixed on the engines.

So far as appearances go, no comparison can be made between the neat engines designed by Mr. S. W. Johnson for the Midland Railway and the uncouth machine "made in America." Indeed, it will be observed that the builders describe the engine as a "Mogul," an Americanism, which can in this case be freely (and ap-
positely) translated "*mongrel*," which aptly describes the Midland Railway's "2501" type of engines.



TO THE SUPERINTENDENT OF THE LINE

The Little East West North Southern Railway

DEAR SIR,—

I trust that you'll excuse
A mild attempt to lay the views
Of many travellers by your line
Before you. That the views are mine
As well, is quite beside the mark,
Though true, and further, if the Ark,
Or rather, I should say the Flood
Divides the views of younger blood
From those which spring from older veins
(And please to note that all our brains
Depend on circulation's aid).
The sooner that a change is made
From antediluvian times
The better, for much fewer crimes
Against your rules shall we commit.
That is the point, now see to it.

* * *

The fact is this, Sir, that for those who
smoke
The carriages supplied (I do not joke)
Are quite too insufficient. Hence it comes
About that smokers all may twirl their
thumbs
Or grunt or grind their teeth or d—
your eyes
For aught you care, and there the trouble
lies.
As matters stand to-day, the morning
traids
Have scarcely stopped, or eased their
coupling chains,
When such a helter-skelter up and down
The platform straight takes place, you'd
think the town
Gone mad, or else a riot had begun.
By no means so; but when their seats
they've won,

Those happy victors forth from coat and
vest
Produce their pipes and lights and smoke
with zest;
The smoking carriage gained by well-
trained skill,
They feel the pride of strength of limb
and will.
But what of those poor souls whose luck-
less feet,
Or late, or misdirected in the heat
Of struggling clamour at the carriage
door,
Have failed to bear their owners where
the law
Permits the pipe of peace? Hard fate is
theirs,
And harder still the look which bears
The grim face of the passenger morose,
In solitary state and cool repose,
Replying to the question, "Sir, do you
Object to smoking?" "Certainly I do."
And frequently it happens, strange to say,
That half-a-dozen carriages you may
Find such as these, one-occupant in each
Prepared, nay keen, his grandmother to
teach,
A walking copy of your Bye-laws Sheet,
And pleased with scorn the mild request
to treat.

* * *

Now that, Sir, as the lawyers say,
Is all my case. It seems to-day
To be your settled plan that four
Or five compartments, may be more,
On every first-class coach shall be
Reserved for those whose enmity

Against tobacco, and their love
Of solitude and things above
The grasp of ordinary men
Demand five empty seats, that then
They may have room to put their hat,
And paper too, when tired of that,
While one compartment, which remains,
Some eight poor smokers oft contains.
This state of things is quite absurd,
And truth it is that we have erred
In tolerating it so long;
With you it lies to right our wrong.
A simple cure is plain to see,
That extra smoking room there be
Provided, and without delay;
But yet there is a better way,
And pleasanter for all alike.
If you have courage, Sir, to strike
Against the old mistaken plan
Of marking for the smoking man
A few compartments here and there,
And choose to be the pioneer
Of practice more in consonance
With progress and the wide advance
Of smoking spread through all the land;

In other words, meet the demand
By setting carriages apart
For non-smokers who lack the art
Of finding in tobacco's charms
A solace from the keen alarms,
Which trouble anxious men, and those
Which spring from pain and business
woes.

Disclaiming all desire to twit
You, Sir, with any want of wit
To see where your advantage lies,
You must allow, in most men's eyes,
Your pioneering powers so far
Have not shown fairly what you are,
Or can be, shall we say? Well, here
You have a chance to pioneer.

* * *

The change is bound to come, Sir, but
when once

It has come—who will then have been the
dunce?

So grab the forelock on the brow of Time
While yet you may, and thank me for my
rhyme.

J. S. H.



WHAT THE RAILWAYS ARE DOING



CALEDONIAN.

IN our issue of February 1898, we chronicled the appointment of Mr. J. D. Lang as Assistant District Superintendent, unattached. Mr. Lang has now been appointed District Superintendent, with headquarters at Perth, and will have charge of the central section of the system. It embraces that part of the company's main line between Alloa Junction, near Larbert, on the south, and Guthrie Junction on the north. This district includes the branch lines of Plean, Callander, Crieff, Comrie, Methven, Blairgowrie, Alyth, Kirriemuir, the Forfar and Brechin line, and the Carse of Gowrie. Mr. Lang will have charge of both passenger and goods traffic in that district. Mr. Lang entered the service of the Caledonian Railway Company when a lad, in the sixties. He was for many years attached to the audit office; thereafter he became attached to the General Manager's department, where he laboured for ten years. Mr. Lang's appointment is a popular one in the service.

CAMBRIAN.

Commencing on the 1st July, several important accelerations in the train service between London, Birmingham, etc., and the Cambrian Coast will come into force. Meanwhile commencing on May 24th and every Wednesday during the season, weekly and fortnightly excursions will be run, Up and Down, between London and Aberystwyth, Towyn, Barmouth, Harlech, Portmadoc, Criccieth, Pwllheli, Oswestry, Newtown, Builth Wells, and other Cambrian Stations. Week End and Ten Days' Excursion Bookings from most of the principal centres in England are in operation all the year round.

FURNESS.

Extensive preparations in the way of facilities for tourists are being arranged by Mr. Aslett, who is a past master in the art of attracting traffic to the various railways over which he has from time to time presided.

The capital service of London and North-Western Railway expresses between London and Carnforth offers an excellent means for Londoners to visit the Lake District, the Isle of Man, the Cumberland, and other resorts served by the Furness Railway. The Furness Railway on its part taking pains to provide capital connections at Carnforth with the London and North Western Railway trains. A glance through "Tours Through Lake-Land," issued gratuitously by the Furness Railway, will show the numerous advantages of visiting this part of the country.

GLASGOW AND SOUTH WESTERN.

Mr. D. Cooper, the experienced General Manager, is determined to have rolling stock quite equal to that of the competitors of the Glasgow and South Western Railway, and the railway is now constructing at Kilmarnock Works a number of bogie corridor-carriages to form a train for the Glasgow and Stranraer service. The vehicles, which are expected to be ready early in July, will leave Glasgow each day at 12.30 p.m., and luncheon will be served in the saloon on the outward journey and dinner on the return run.

GREAT CENTRAL.

The traffic on the London Extension continues to increase, the new route to Manchester, Sheffield, Nottingham, etc., being already a favourite one. On the 1st of July the Great Central Railway will introduce a really express service of trains on the new line, when, of course, further traffic will be attracted to this railway.

The Earl of Wharnccliffe, who resigned the chairmanship of the Great Central Railway on the 5th of May, died on Saturday the 13th ult. His lordship was born in 1827, was the third Baron Wharnccliffe, and was raised to the earldom in 1876. The deceased was deputy-chairman of the North Cornwall Railway Company, and a director of the Sheffield and South Yorkshire Navigation Company, and the Henry Rifled Barrel Engineering Company.

Mr. A. Henderson, M.P., is the new chairman.

Two additional platforms have been opened at the Marylebone terminus, making five in all. The 'in' and 'out' parcels offices have also been opened, and the refreshment and dining rooms will be opened in a week or so. Taking advantage of the clause in the agreement with the Metropolitan, which only prevents Great Central trains "picking up and setting down traffic between any two stations of the owning (Metropolitan) Company," the Great Central Railway has now two up and two down trains every day, by which passengers are booked to and from Harrow. The Hotel Great Central will be opened early in June.

GREAT EASTERN.

The announcement made on Wednesday the 17th of May to the effect that Sir William Birt, yielding to the claims of advancing years, had determined to relinquish the onerous position of General Manager to the Great Eastern Railway has caused wide regret, not only amongst all classes of Great Eastern servants, but throughout the railway world at large. Sir William Birt was the doyen of Railway Managers, and his kindly presence and weighty words of advice will be missed at Clearing House meetings for many a long day.

The retiring General Manager is the fourth son of the late Mr. John Birt, for many years in the Civil Service, and entered the service of the Eastern Counties Railway as long ago as 1848, being then a lad of 14 years of age. In 1862, when by a process of amalgamation the Eastern Counties became part and parcel of the Great Eastern Railway, Sir William was transferred to the new undertaking. In 1866 he was appointed Goods Manager, and on the retirement of Mr. Swarbrick in 1880, he became Acting General Manager, being formally appointed General Manager on the 1st of January 1881.

Sir William received the honour of Knighthood on the 1st of January 1897; he is a Chevalier of the Belgian Order of Leopold, a Colonel in the Engineer and Railway Volunteer Staff Corps, and an Associate of the Institute of Civil Engineers. He married, in January 1872, Constantia, elder daughter of the late Mr.

Matthew Watson Thomas, of Austin Friars and Walthamstow.

Of the vast strides the Great Eastern has made under the management of Sir William Birt, it is unnecessary here to speak, as they were fully dealt with in the RAILWAY MAGAZINE last December.

Next to that of regret at Sir William's retirement, the predominant feeling expressed in Great Eastern circles is one of satisfaction that the Directors have appointed Mr. J. F. S. Gooday to succeed him.

Mr. Gooday entered the service of the Great Eastern Railway in 1863, and after having been agent for the Company at Leeds, was appointed Continental Traffic Manager in 1877. For twenty years he held that post, during which time the present magnificent fleet of Great Eastern steamers was evolved. In January 1898 Mr. Gooday succeeded Sir Allen Sarle as General Manager of the London, Brighton and South Coast Railway. Now he has received the rare honour of being asked by the Directors of the Great Eastern to return to that Company as General Manager.

That Sir William Birt may long live to enjoy his well earned retirement, and that Mr. Gooday may have a lengthy and prosperous career before him as General Manager of the Great Eastern Railway is, we are sure, the cordial wish of all our readers.

GREAT NORTHERN.

Recently the 5.45 p.m. down express was run in two parts, the second consisted of a covered carriage truck, an empty North British saloon, a London and South Western 3rd class coach with a party of emigrants from Southampton to Hull, a London and South Western van with the luggage of the emigrants, two North Eastern coaches for Newcastle, and a break van. An extremely mixed but not a very remunerative train-load, certainly.

We regret to announce the tragic death of the Earl of Strafford, the deceased nobleman being run over and killed at a crossing in connection with Potter's Bar Station on Tuesday, May 16th, about 6 p.m. The Earl was at the bottom of the up-platform when the ordinary express passed through, and drew back. His lordship then stepped over the signal wires near the line, and a short time afterwards a special express from Cambridge

to London ran through, his lordship being caught by the engine of the special and his mutilated body found on the line afterwards.

GREAT NORTHERN (IRELAND).

The Great Northern Railway (Ireland) have just added a number of new carriages on their main-line trains, and the travelling public will be quick in appreciating the attention. The new service consists of bogie carriages and vans of a very superior type, each 56 feet in length, lighted by electricity, and heated throughout with steam from the engine. The first-class carriages are supplied with Laycock's well-known "torpedo" ventilators for regulating the amount of heat required by travellers, and they are elegantly upholstered in moquette velvet. Some of the new carriages have a coupé compartment with handsome plate-glass fronts. Much satisfaction will be felt with the manner in which the second-class carriages have been finished, both of these classes being supplied with lavatory accommodation. But, while catering for the accommodation of the higher-class traffic, the General Manager of the Company, Mr. Henry Plews, has not at all been unmindful of the necessities of the third-class passenger, and in the new stock is included a number of cushioned-carriages for this class, lighted by electricity and heated by steam from the engine. By the adoption of a new style of oval roof, which is higher at the sides than usual, these carriages give a larger air space than any other railway carriages in Great Britain or Ireland, the height from the floor of the carriage to the centre of the roof being 7 ft. 2 in., and from the floor to the side of the roof 6 ft. 10 in. The vans are novelties and curiosities in their way, being quite down-to-date in every particular. They are supplied with the apparatus adopted by the Company for conveying bicycles suspended, so as to avoid any injury to the machines, and, in addition to their being lighted by electricity, by an ingenious plan the sidelights of these vans are also electrically lighted. All these carriages and vans have been designed by the Great Northern Railway's locomotive engineer, Mr. Clifford, and they have been built in their Dundalk Works.

GREAT SOUTHERN AND WESTERN.

The popularity of Mr. R. C. Colhoun, the experienced General Manager of this company, is well-known in the railway service, and Mr. Bell, the Superintendent of the Line, has now received a diamond pin as a souvenir of the Duke and Duchess of York's appreciation of the excellent train arrangements made during their recent visit here. The railway travelling of the Royal pair, which was altogether confined to the Great Southern and Western line, necessitated four or five different "specials," and these were all under the personal charge of Mr. Bell.

GREAT WESTERN.

The responsible officers are busily engaged in perfecting the summer arrangements which Mr. Wilkinson, with his well-known determination to place the Great Western Railway right in the van of railway progress, has arranged to be on a liberal scale. There is no doubt, therefore, that Mr. Allen will provide an exceptionally good time-table for July, whilst the arrangements for conveying passengers' luggage in advance are to be considerably extended.

Now in his eighty-second year, George House of New Swindon, is said to hold the position of being the oldest railway servant in the United Kingdom. He still follows his occupation as an employee of the Great Western Railway Company. He has a record of over 63 years with the Great Western Railway, having commenced work for them in the October of 1835 at Maidenhead, being engaged in the construction of the line there under the supervision of Brunel.

HIGHLAND.

"Holiday Resorts on the Highland Railway for 1899," shows a decided improvement on the "Highland Railway Guide" of previous years, the illustrations being specially good; in addition to which the book contains a £100 insurance coupon. Mr. Wilson is to be congratulated on the new edition of this booklet.

LONDON AND NORTH WESTERN.

With the commencement of June several changes will be made in the London and North Western staffs in the northern dis-

tricts. Mr. Henry Cattle, Superintendent of the Lancaster and Carlisle district, will retire, after more than twenty years' service, and will be succeeded at Lancaster by Mr. L. D. Price, now Assistant Superintendent at Liverpool. Mr. R. T. Morcom, at present Assistant Superintendent at Lancaster, will go to Wigan, and have charge of the Blackburn and Liverpool section. Mr. Morcom is to be succeeded by a gentleman from Lime Street Station, Liverpool.

Mr. F. H. Dent has been appointed as District Superintendent of the Chester and Holyhead District in succession to Mr. E. A. Neele, resigned.

The London and North Western Company's new line from Buxton to Ashbourne has been completed, and will be opened for goods traffic on July 1, and for passenger traffic a month later.

This new line utilises a portion of the historical Cromford and High Peak Railway, the gradient and curves having been improved for the purpose of working this railway on the usual methods.

LONDON AND SOUTH WESTERN.

The new "Illustrated Guide and Official List of Lodgings," etc., just issued by the London and South Western Railway, is much superior to the general run of these handbooks, and is another proof of Mr. Owens' determination to keep the London and South Western Railway well to the front in connection with everything in which the railways compete with each other. The book contains about 200 pages, and can be had gratis.

With the advent of Mr. S. Fay as Superintendent of Line, rumours were rife of a London and South Western Railway run from London to Exeter without a stop. Although the July train service will show many accelerations, we are informed that the above run will not be scheduled.

NORTH BRITISH.

Sir William Laird, the new North British Railway Chairman, is father-in-law to Mr. G. B. Wieland, the former Secretary of the North British Railway, and now on the Board of Directors.

The North British Railway Company

have just turned out several new third-class corridor carriages from their Cow-lairs workshops. The vehicles look very well, but are only six-wheel coaches, and there is only one lavatory to each carriage (five compartments).

NORTH EASTERN.

Comparatively few of the many thousand readers of the RAILWAY MAGAZINE have any idea of the magnitude of the work carried on by the North Eastern Railway at their Forth Goods Station in Newcastle.

Last year, for instance, the total amount of traffic dealt with at the Newcastle stations, including the old Trafalgar and Quayside branches, which are important adjuncts of the Forth, was no less than 1,022,624 tons, as against 942,623 tons in 1897; while it will probably astonish most people to learn that the traffic carted by the North Eastern Railway Company's horses in and out of the Newcastle goods stations last year was no less an amount than 243,531 tons. Probably a more tangible conception of the great business transacted may be had when we state that last year it required to convey the goods and live-stock in and out of Newcastle 507,489 trucks, which, if it were possible to put on the rails at one time, would make a train of close upon 2,000 miles in length.

Mr. Gibb, the General Manager, evidently knows how to attract and retain goods traffic to the North Eastern Railway.

SOUTH EASTERN AND CHATHAM AND DOVER.

The working of these two lines as one undertaking will provide additional facilities for the conveyance of through traffic between the railways north and south of the Thames. Thus, vehicles from the London, Brighton and South Coast, London, Chatham and Dover, and London and South Western Railways for the Great Northern Railway, *via* Snow Hill, will not be able to be attached to the through South Eastern trains, thereby giving a greatly increased number of trains available for through vehicles, and consequent acceleration of the total time spent in transit between two points.

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